

D. ENGINEERING ANALYSIS

D.1 - FACILITY DESIGN

Testimony of Shahab Khoshmashrab

D.1.1 SUMMARY OF CONCLUSIONS

The California Energy Commission staff concludes that the design, construction, and eventual closure of the project and its linear facilities would likely comply with applicable engineering laws, ordinances, regulations and standards. The proposed conditions of certification, below, would ensure compliance with these laws, ordinances, regulations and standards.

D.1.2 INTRODUCTION

Facility design encompasses the civil, structural, mechanical, and electrical engineering design of the Genesis Solar Energy Project (GSEP) and is not intended as a California Environmental Quality (CEQA) or National Environmental Policy Act (NEPA) analysis. The purpose of this analysis is solely to:

- Verify that the laws, ordinances, regulations and standards (LORS) that apply to the engineering design and construction of the project have been identified;
- Verify that both the project and its ancillary facilities are sufficiently described, including proposed design criteria and analysis methods, in order to provide reasonable assurance that the project would be designed and constructed in accordance with all applicable engineering LORS, in a manner that also ensures the public health and safety;
- Determine whether special design features should be considered during final design to address conditions unique to the site which could influence public health and safety; and
- Describe the design review and construction inspection process and establish the conditions of certification used to monitor and ensure compliance with the engineering LORS, in addition to any special design requirements.

Subjects discussed in this analysis include:

- Identification of the engineering LORS that apply to facility design;
- Evaluation of the applicant's proposed design criteria, including identification of criteria essential to public health and safety;
- Proposed modifications and additions to the application for certification (AFC) necessary for compliance with applicable engineering LORS; and
- Conditions of certification proposed by staff to ensure that the project would be designed and constructed to ensure public health and safety and comply with all applicable engineering LORS.

D.1.3 LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical, and electrical) are described in the AFC (Solar Millennium 2009a, § 3.11). Key LORS are listed in **Facility Design Table 1**, below:

FACILITY DESIGN Table 1
Key Engineering Laws, Ordinances, Regulations and Standards (LORS)

| Applicable LORS | Description |
|-----------------|--|
| Federal | Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health standards |
| State | 2007 California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations) |
| Local | Riverside County regulations and ordinances |
| General | American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM) |

D.1.4 PROPOSED PROJECT

D.1.4.1 SETTING AND EXISTING CONDITIONS

The GSEP would be built on a site located in Riverside County, California. For more information on the site and its related project description, please see the **Project Description** section of this document. Additional engineering design details are contained in the AFC (GSEP 2009a, AFC § 3.11).

D.1.4.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The purpose of this analysis is to ensure that the project would be built to applicable engineering codes and ensure public health and life safety. This analysis further verifies that applicable engineering LORS have been identified and that the project and its ancillary facilities have been described in adequate detail. It also evaluates the applicant's proposed design criteria, describes the design review and construction inspection process, and establishes conditions of certification that would monitor and ensure compliance with engineering LORS and any other special design requirements. These conditions allow both the California Energy Commission (Energy Commission) compliance project manager (CPM) and the applicant to adopt a compliance monitoring scheme that would verify compliance with these LORS.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access, in addition to the criteria for designing and

constructing linear support facilities such as natural gas and electric transmission interconnections. The applicant proposes the use of accepted industry standards (see GSEP 2009a, Section 3.11 for a representative list of applicable industry standards), design practices, and construction methods in preparing and developing the site. Staff concludes that this project, including its linear facilities, would most likely comply with all applicable site preparation LORS, and proposes conditions of certification (see below and the **Geology and Paleontology** section of this document) to ensure that compliance.

MAJOR STRUCTURES, SYSTEMS, AND EQUIPMENT

Major structures, systems, and equipment are structures and their associated components or equipment that are necessary for power production, costly or time consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS. Major structures and equipment are identified in the proposed Condition of Certification **GEN-2**, below. Typically, **Facility Design Table 2** in Condition of Certification **GEN-2** lists the major structures and equipment identified in the AFC and other project related information available before project licensing; this list is based on the preliminary design of the project. The master drawing and master specifications lists described in Condition of Certification **GEN-2**, however, include the project-related documents based on the project's detailed design and may include additional documents for structures and equipment not identified in **Facility Design Table 2**. (Detailed project design typically occurs after project licensing and is not available at this time.)

GSEP shall be designed and constructed to the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and other applicable codes and standards in effect when the design and construction of the project actually begin. If the initial designs are submitted to the chief building official (CBO) for review and approval after the update to the 2007 CBSC takes effect, the 2007 CBSC provisions shall be replaced with the updated provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed according to their appropriate lateral force procedure, staff has included condition of certification **STRUC-1**, below, which, in part, requires the project CBO's review and approval of the owner's proposed lateral force procedures before construction begins.

PROJECT QUALITY PROCEDURES

The project's AFC (GSEP 2009a, Appendix A and Sections 3.5 and 5.5.6) describes a quality program intended to inspire confidence that its systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with all

appropriate power plant technical codes and standards. Compliance with design requirements will be verified through specific inspections and audits. Implementation of this quality assurance/quality control (QA/QC) program will ensure that GSEP is actually designed, procured, fabricated, and installed as described in this analysis.

COMPLIANCE MONITORING

Under Section 104.2 of the CBC, the CBO is authorized and directed to enforce all provisions of the CBC. The Energy Commission itself serves as the building official, and has the responsibility to enforce the code, for all of the energy facilities it certifies. In addition, the Energy Commission has the power to interpret the CBC and adopt and enforce both rules and supplemental regulations that clarify application of the CBC's provisions.

The Energy Commission's design review and construction inspection process conforms to CBC requirements and ensures that all facility design conditions of certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to perform design review and construction inspections and act as delegate CBOs on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to provide technical expertise that is not provided by the local official alone. The applicant, through permit fees provided by the CBC, pays the cost of these reviews and inspections. While building permits in addition to Energy Commission certification are not required for this project, the applicant pays in lieu of CBC permit fees to cover the costs of these reviews and inspections.

Engineering and compliance staff will invite Riverside County or a third-party engineering consultant to act as CBO for this project. When an entity has been assigned CBO duties, Energy Commission staff will complete a memorandum of understanding (MOU) with that entity to outline both its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed conditions of certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities, and qualifications of the engineers who will design and build the proposed project (conditions of certification **GEN-1** through **GEN-8**). These engineers must be registered in California and sign and stamp every submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that every element of the project's construction (subject to CBO review and approval) be approved by the CBO before it is performed. They also require that qualified special inspectors perform or oversee special inspections required by all applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written so that no element of construction (of permanent facilities subject to CBO review and approval) which could be difficult to reverse or correct can proceed without prior CBO approval. Elements of construction that are not difficult to reverse may proceed without approval of the plans. The applicant bears the responsibility to fully modify construction elements

in order to comply with all design changes resulting from the CBO's subsequent plan review and approval process.

D.1.4.3 CEQA LEVEL OF SIGNIFICANCE

As described in the **Introduction** above, the Facility Design section addresses LORS consistency and provides the agencies a vehicle for verifying compliance with these LORS during construction and operation of power generating facilities. This section is not intended to address environmental impacts under either CEQA or NEPA.

D.1.5 REDUCED ACREAGE ALTERNATIVE

The Facility Design section is not intended to address environmental impacts under either CEQA or NEPA.

D.1.6 DRY COOLING ALTERNATIVE

The Facility Design section is not intended to address environmental impacts under either CEQA or NEPA.

D.1.8 NO PROJECT / NO ACTION ALTERNATIVE

The Facility Design section is not intended to address environmental impacts under either CEQA or NEPA.

D.1.9 CUMULATIVE IMPACT ANALYSIS

The Facility Design section is not intended to address environmental impacts under either CEQA or NEPA.

D.1.10 COMPLIANCE WITH LORS

A detailed discussion of the proposed project's compliance with LORS applicable to facility design is provided above in subsection D.1.4.2.

D.1.11 NOTEWORTHY PUBLIC BENEFITS

Staff has not identified any noteworthy public benefits associated with this Facility Design section.

D.1.12 PROPOSED CONDITIONS OF CERTIFICATION/MITIGATION MEASURES

GEN-1 The project owner shall design, construct, and inspect the project in accordance with the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California

Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility. All transmission facilities (lines, switchyards, switching stations and substations) are covered in the conditions of certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when the successor to the 2007 CBSC is in effect, the 2007 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Verification: Within 30 days following receipt of the certificate of occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission's decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the certificate of occupancy within 30 days of receipt from the CBO.

Once the certificate of occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires CBO approval for compliance with the above codes. The CPM will then determine if the CBO needs to approve the work.

GEN-2 Before submitting the initial engineering designs for CBO review, the project owner shall furnish the CPM and the CBO with a schedule of facility design submittals, and master drawing and master specifications lists. The schedule shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM upon request.

Verification: At least 60 days (or a project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO and to the CPM the schedule, the master drawing and master specifications lists of documents to be submitted to the CBO for review and approval. These documents shall

be the pertinent design documents for the major structures and equipment listed in **Facility Design Table 2**, below. Major structures and equipment shall be added to or deleted from the table only with CPM approval. The project owner shall provide schedule updates in the monthly compliance report.

Facility Design Table 2
Major Structures and Equipment List

| Equipment/System | Quantity (Plant) |
|--|-----------------------------|
| Steam Turbine Generator Foundation and Connections | 2 |
| Start-up Boilers Foundations and Connections | 2 |
| Generator Step-up Transformer Foundation and Connections | 2 |
| Unit Auxiliary Transformer Foundation and Connections | 2 |
| Station Service Transformer Foundation and Connections | 6 |
| Surface Condenser Foundation and Connections | 2 |
| Cooling Tower Chemical Feed/Storage Area Structure, Foundation and Connections | 2 |
| Cooling Tower Electrical Enclosure Structure, Foundation and Connections | 2 |
| Cooling Tower Structure, Foundation and Connections | 2 |
| Raw/Fire Tank Structure, Foundation and Connections | 2 |
| Demineralized Water Tank and Pump Skid Structure, Foundation and Connections | 2 |
| Control Room/Warehouse Building Structure, Foundation and Connections | 2 |
| Water Treatment Area Structure, Foundation and Connections | 2 |
| Deaerator/Storage Tank Structure, Foundation and Connections | 2 |
| Feedwater Heaters Foundation and Connections | 2 |
| Gland Steam Condenser Foundation and Connections | 2 |
| Economizers Foundation and Connections | 10 |
| Re-heaters Foundation and Connections | 8 |
| Evaporators Foundation and Connections | 8 |
| Superheaters Foundation and Connections | 4 |
| Expansion Tanks Structure, Foundation and Connections | 2 Lots |
| Blowdown Tanks Structure, Foundation and Connections | 2 |
| Auxiliary Boiler Foundation and Connections | 2 |
| Generator Circuit Breaker Foundation and Connections | 2 |
| Main Electrical Enclosure Structure, Foundation and Connections | 2 |
| Ullage System Area Foundation and Connections | 2 |
| Waste Water Tank Structure, Foundation and Connections | 2 |
| Closed Cooling Water Heat Exchanger Foundation and Connections | 4 |
| Fire Pump House Structure, Foundation and Connections | 2 |
| Fire Protection Sprinkler House Structure, Foundation and Connections | 6 |
| Start Diesel Generator Foundation and Connections | 2 |
| Above Ground Diesel Fuel Storage Tank Structure, Foundation and Connections | 2 |

| Equipment/System | Quantity (Plant) |
|---|-----------------------------|
| Excitation Transformer Foundation and Connections | 2 |
| Turbine Area Flash Tank Structure, Foundation and Connections | 2 |
| Lube Oil and EHC Skid Structure, Foundation and Connections | 2 |
| Oil/Water Separator Foundation and Connections | 2 |
| Closed Cooling Water Expansion Tank Structure, Foundation and Connections | 2 |
| Nitrogen Bulk Storage and Vaporizer Structure, Foundation and Connections | 2 |
| Emergency Diesel Generator Foundation and Connections | 2 |
| Pipe Racks | 1 Lot |
| Pumps Skid Structure, Foundation and Connections | 1 Lot |
| Solar Field Reflectors and Receivers Foundations and Connections | 1 Lot |
| Drainage Systems (including sanitary drain and waste) | 1 Lot |
| High Pressure and Large Diameter Piping and Pipe Racks | 1 Lot |
| HVAC and Refrigeration Systems | 1 Lot |
| Temperature Control and Ventilation Systems (including water and sewer connections) | 1 Lot |
| Building Energy Conservation Systems | 1 Lot |
| Substation, Switchboards, Transformers, Buses and Towers | 1 Lot |
| Electrical Cables/Duct Banks | 1 Lot |
| Prefabricated Assemblies | 1 Lot |

GEN-3 The project owner shall make payments to the CBO for design review, plan checks, and construction inspections, based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be consistent with the fees listed in the 2007 CBC, adjusted for inflation and other appropriate adjustments; may be based on the value of the facilities reviewed; may be based on hourly rates; or may be otherwise agreed upon by the project owner and the CBO.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next monthly compliance report indicating that applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California-registered architect, or a structural or civil engineer, as the resident engineer (RE) in charge of the project. All transmission facilities (lines, switchyards, switching stations, and substations) are addressed in the conditions of certification in the **Transmission System Engineering** section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided that each part is

clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The RE shall:

1. Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these conditions of certification, approved plans, and specifications;
3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the conditions of the project;
4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests when they do not conform to approved plans and specifications.

The resident engineer (or his delegate) must be located at the project site, or be available at the project site within a reasonable period of time, during any hours in which construction takes place.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has five days to submit the resume and registration number of the newly

assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: a civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; a mechanical engineer; and an electrical engineer. (California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 require state registration to practice as a civil engineer or structural engineer in California). All transmission facilities (lines, switchyards, switching stations, and substations) are handled in the conditions of certification in the **Transmission System Engineering** section of this document.

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (for example, proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit, to the CBO for review and approval, the names, qualifications, and registration numbers of all responsible engineers assigned to the project.

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

1. Review the foundation investigations, geotechnical, or soils reports prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;
2. Design (or be responsible for the design of), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities,

underground utilities, culverts, site access roads and sanitary sewer systems; and

3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to the construction procedures.
- B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:
1. Review all the engineering geology reports;
 2. Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be susceptible to liquefaction, rapid settlement or collapse when saturated under load;
 3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the 2007 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and
 4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations.

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare a final soils grading report; and
2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 2007 CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;

3. Monitor construction progress to ensure compliance with engineering LORS;
 4. Evaluate and recommend necessary changes in design; and
 5. Prepare and sign all major building plans, specifications, and calculations.
- E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform to all of the mechanical engineering design requirements set forth in the Energy Commission's decision.
- F. The electrical engineer shall:
1. Be responsible for the electrical design of the project; and
 2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, including prefabricated assemblies, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 2007 CBC. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable,

shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Inspect the work assigned for conformance with the approved design drawings and specifications;
3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and
4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and other provisions of the applicable edition of the CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next monthly compliance report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend required corrective actions. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification and, if appropriate, applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next monthly compliance report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall

request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site or at another accessible location during the operating life of the project. Electronic copies of the approved plans, specifications, calculations, and marked-up as-builts shall be provided to the CBO for retention by the CPM.

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, in the next monthly compliance report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing the final approved engineering plans, specifications, and calculations described above, the project owner shall submit to the CPM a letter stating both that the above documents have been stored and the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide to the CBO three sets of electronic copies of the above documents at the project owner's expense. These are to be provided in the form of "read only" (Adobe pdf 6.0) files, with restricted (password-protected) printing privileges, on archive quality compact discs.

CIVIL-1 The project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils, geotechnical, or foundation investigations reports required by the 2007 CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next monthly compliance report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications, and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area.

Verification: The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil

conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the 2007 CBC. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following monthly compliance report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans.

Verification: Within 30 days (or project owner- and CBO-approved alternative time frame) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes, along with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next monthly compliance report.

STRUC-1 Prior to the start of any increment of construction of any major structure or component listed in **Facility Design Table 2** of condition of certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for the following items (from **Table 2**, above):

1. Major project structures;
2. Major foundations, equipment supports, and anchorage; and

3. Large field-fabricated tanks.

Construction of any structure or component shall not begin until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (for example, highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications;
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation;
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations, and specifications shall be signed and stamped by the responsible design engineer; and
5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS.

Verification: At least 60 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of construction of any structure or component listed in **Facility Design Table 2** of condition of certification **GEN-2**, above, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next monthly compliance report, a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement

from which sample was taken, and mix design designation and parameters);

2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structural activities requiring special inspections shall be in accordance with the 2007 CBC.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 2007 CBC, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the monthly compliance report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the 2007 CBC shall, at a minimum, be designed to comply with the requirements of that chapter.

Verification: At least 30 days (or project owner- and CBO-approved alternate time frame) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following monthly compliance report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the monthly compliance report following completion of any inspection.

MECH-1 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in **Facility Design Table 2**, condition of certification **GEN-2**, above. Physical layout drawings and drawings not related to code compliance and life safety need not be submitted. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to CBO design review and approval, and submit a signed statement to the CBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards, which may include, but are not limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);
- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);
- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- Riverside County codes.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of major piping or plumbing construction listed in **Facility Design Table 2**, condition of certification **GEN-2**, above, the project owner shall submit to the CBO for design review and approval the final plans, specifications, and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of that installation.

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated, and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications, and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of that construction. The final plans, specifications and calculations shall include approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the

proposed final design plans, specifications and calculations conform with the applicable LORS.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 480 Volts or higher (see a representative list, below), with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans shall include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and
2. system grounding drawings.

B. Final plant calculations must establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements; and
7. lighting energy calculations.

C. The following activities shall be reported to the CPM in the monthly compliance report:

1. Receipt or delay of major electrical equipment;

2. Testing or energization of major electrical equipment; and
3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission decision.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

D.1.13 CONCLUSIONS

1. The laws, ordinances, regulations and standards (LORS) identified in the Genesis Solar Energy Project (GSEP) AFC and supporting documents directly apply to the project.
2. Staff has evaluated the proposed engineering LORS, design criteria, and design methods in the record, and concludes that the design, construction, and eventual closure of the project will likely comply with applicable engineering LORS.
3. The proposed conditions of certification will ensure that GSEP is designed and constructed in accordance with applicable engineering LORS. This will be accomplished through design review, plan checking, and field inspections that will be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.
4. Though future conditions that could affect decommissioning are largely unknown at this time, it can reasonably be concluded that if, the project owner submits a decommissioning plan as required in the **General Conditions** portion of this document prior to decommissioning, decommissioning procedures will comply with all applicable engineering LORS.

Energy Commission staff recommends that:

1. The proposed conditions of certification be adopted to ensure that the project is designed and constructed in a manner that protects the public health and safety and complies with all applicable engineering LORS;
2. The project be designed and built to the 2007 CBSC (or successor standards, if in effect when initial project engineering designs are submitted for review); and
3. The CBO reviews the final designs, checks plans, and performs field inspections during construction. Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

D.1.14 REFERENCES

GSEP 2009a – Genesis Solar Energy Project/T. Bernhardt (tn: 53083). Application for Certification for the Genesis Solar Energy Project. 08/31/2009

D.2 – GEOLOGY, PALEONTOLOGY, AND MINERALS

Testimony of Dal Hunter, Ph.D. CEG.

D.2.1 SUMMARY OF CONCLUSIONS

The proposed Genesis Solar Energy Project site is located in a moderately active geological area of the eastern Mojave Desert geomorphic province in eastern Riverside County in southeastern California. Because of its geological setting, the site could be subject to moderate levels of earthquake-related ground shaking. The preliminary geotechnical and geological hazards investigation also indicates a potential for expansive soils and hydrocompaction (GSEP 2009a). The effects of ground shaking would need to be mitigated through structural designs required by the California Building Code (CBC 2007) and a site-specific, design-level project geotechnical report. The CBC (2007) requires that structures be designed to resist seismic stresses from ground acceleration and, to a lesser extent, liquefaction. A site-specific, design-level geotechnical investigation would also present standard engineering design recommendations for mitigation of site soil conditions.

There are no known viable geological or mineralogical resources at the proposed Genesis Solar Energy Project site. Locally, paleontological resources have been documented within lacustrine sediments in Ford Dry Lake, and regionally in older Quaternary alluvium. Older alluvium and lacustrine deposits may underlie younger Quaternary alluvium at an undetermined depth beneath the site surface. Potential impacts to paleontological resources would be mitigated through worker training and monitoring by qualified paleontologists, as required by Conditions of Certification, **PAL-1** through **PAL-7**.

Based on its independent research and review, the United States Bureau of Land Management (BLM) and California Energy Commission (Energy Commission) staffs (hereafter jointly referred to as “staff”) believe that the potential is low for significant adverse impacts to the proposed project from geological hazards during its design life and to potential geological, mineralogical, and paleontological resources from the construction, operation, and closure of the proposed project. It is staff’s opinion that the proposed GSEP facility could be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards and in a manner that both protects environmental quality and assures public safety. Conditions of certification referred to herein serve the purpose of both the Energy Commission’s Conditions of Certification for purposes of the California Environmental Quality Act and BLM’s Mitigation Measures for purposes of the National Environmental Policy Act.

D.2.2 INTRODUCTION

U.S. Bureau of Land Management and Energy Commission staff (hereafter jointly referred to as staff), in this section, discuss the potential impacts of geological hazards on the proposed Genesis Solar Energy Project (GSEP) site as well as the project’s potential impacts on geological, mineralogical, and paleontological resources. Staff’s objective is to ensure that there will be no consequential adverse impacts to significant geological and paleontological resources during the project construction, operation, and

closure and that operation of the plant will not expose occupants to high-probability geological hazards. A brief geological and paleontological overview is provided. The section concludes with staff's proposed monitoring and mitigation measures for geological hazards and geological, mineralogical, and paleontological resources, with proposed conditions of certification.

D.2.3 METHODOLOGY AND THRESHOLDS FOR DETERMINING ENVIRONMENTAL CONSEQUENCES

Federal agencies are required to review major federal actions such as the GSEP project under the National Environmental Policy Act (NEPA). This document has been prepared in consultation and coordination with the BLM to also address federal environmental issues. The BLM and CEC have conducted a joint environmental review of the project in a single NEPA/California Environmental Quality Act (CEQA) process. The Federal Land Policy and Management Act of 1976 (FLPMA) establishes the agency's multiple-use mandate to serve present and future generations.

The CEQA Guidelines, Appendix G, provide a checklist of questions that lead agencies typically address.

- Section (V) (c) includes guidelines that determine if a project will either directly or indirectly destroy a unique paleontological resource or site or a unique geological feature.
- Sections (VI) (a), (b), (c), (d), and (e) focus on whether or not the project would expose persons or structures to geological hazards.
- Sections (X) (a) and (b) concern the project's effects on mineral resources.

The California Building Standards Code (CBSC) and CBC (2007) provide geotechnical and geological investigation and design guidelines, which engineers must follow when designing a facility. As a result, the criteria used to assess the significance of a geological hazard include evaluating each hazard's potential impact on the design and construction of the proposed facility. Geological hazards include faulting and seismicity, volcanic eruptions, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, tsunamis, and seiches. Of these, dynamic compaction, hydrocompaction, subsidence, and expansive soils are geotechnical engineering issues but are not normally associated with concerns for public safety.

Staff has reviewed geological and mineral resource maps for the surrounding area, as well as site-specific information provided by the applicant, to determine if any geological and mineralogical resources exist in the area and to determine if operations could adversely affect such geological and mineralogical resources.

To evaluate whether the proposed project and alternatives would generate a potentially significant impact as defined by CEQA on mineral resources, the staff evaluated them

against checklist questions posed in the 2006 CEQA Guidelines, Appendix G, Environmental Checklist established for Mineral Resources. These questions are:

- A. Would the project result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state?
- B. Would the project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

Under NEPA, the impact of the proposed project and alternatives on mineral resources would be considered significant if they would directly or indirectly interfere with active mining claims or operations, or would result in reducing or eliminating the availability of important mineral resources. The staff's evaluation of the significance of the impact of the proposed project on mineral resources includes an assessment of the context and intensity of the impacts, as defined in the NEPA implementing regulations 40 CFR Part 1508.27.

Staff reviewed existing paleontological information and requested records searches from the Natural History Museum of Los Angeles County (NHMLA) and the University of California Museum of Paleontology at Berkeley (UCMP) for the site area. Site-specific information generated by the applicant for the proposed GSEP project was also reviewed. All research was conducted in accordance with accepted assessment protocol (SVP 1995) to determine whether any known paleontological resources exist in the general area. If present or likely to be present, conditions of certification which outline required procedures to mitigate impacts to potential resources, are proposed as part of the project's approval.

The Antiquities Act of 1906 (16 United States Code [USC]) requires that objects of antiquity be taken into consideration for federal projects and the California Environmental Quality Act, Appendix G, also requires the consideration of paleontological resources. The Paleontological Resources Preservation Act of 2009 requires the Secretaries of the United States Department of the Interior and Agriculture to manage and protect paleontological resources on Federal land using scientific principles and expertise. The potential for discovery of significant paleontological resources or the impact of surface disturbing activities to such resources is assessed using the Potential Fossil Yield Classification (PYFC) system. This system includes three conditions (Condition 1 [areas known to contain vertebrate fossils]; Condition 2 [areas with exposures of geological units or settings that have high potential to contain vertebrate fossils]; and Condition 3 [areas that are very unlikely to produce vertebrate fossils]). The PYFC class ranges from Class 5 (very high) to Class 1 (very low) (USDI 2007).

The proposed conditions of certification allow BLM's Authorized Officer, the Energy Commission's compliance project manager (CPM) and the applicant to adopt a compliance monitoring scheme ensuring compliance with laws, ordinances, regulations, and standards (LORS) applicable to geological hazards and the protection of geological, mineralogical, and paleontological resources.

Based on the information below, it is staff's opinion that the potential for significant adverse impacts to the project from geological hazards, and to potential geological, mineralogical, and paleontological resources from the proposed project, is low.

D.2.3.1 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Applicable laws, ordinances, regulations, and standards (LORS) are listed in the application for certification (AFC) (GSEP 2009a). The following briefly describes the current LORS for both geological hazards and resources and mineralogical and paleontological resources.

**Geology and Paleontology Table 1
Laws, Ordinances, Regulations, and Standards (LORS)**

| <u>Applicable Law</u> | <u>Description</u> |
|---|---|
| <u>Federal</u> | |
| Antiquities Act of 1906 (16 United States Code [USC], 431-433) | The proposed GSEP facility site is located entirely on land currently administered by the Bureau of Land Management (BLM). Although there is no specific mention of natural or paleontological resources in the Act itself, or in the Act's uniform rules and regulations (Title 43 Part 3, Code of Federal Regulations [43 CFR Part 3], 'objects of antiquity' has been interpreted to include fossils by the Federal Highways Act of 1956, the National Park Service (NPS), the BLM, the Forest Service (USFS), and other Federal agencies. |
| National Environmental Policy Act (NEPA) of 1970 (42 USC 4321, et. seq.) | Established the Council on Environmental Quality (CEQ), which is charged with preserving 'important historic, cultural, and natural aspects of our national heritage'. |
| Federal Land Policy and Management Act (FLPMA) of 1976 (43 USC 1701-1784) | Authorizes the BLM to manage public lands to protect the quality scientific, scenic, historical, archeological, and other values, and to develop 'regulations and plans for the protection of public land areas of critical environmental concern', which include 'important historic, cultural or scenic values'. Also charged with the protection of 'life and safety from natural hazards'. |
| Paleontological Resources Preservation Act (PRPA) (Public Law [PL] 111-011) | Authorizes Departments of Interior and Agriculture Secretaries to manage the protection of paleontological resources on Federal lands. |
| National Historic Preservation Act of 1966 (NHPA) (16 USC 470) | Establishes policies for the 'preservation of the prehistoric and historic resources of the United States', under the direction of the Secretary of the Interior and the BLM. |
| <u>State</u> | |
| California Building Code (CBC), 2007 | The CBC (2007) includes a series of standards that are used in project investigation, design, and construction (including grading and erosion control). |

| <u>Applicable Law</u> | <u>Description</u> |
|--|---|
| Alquist-Priolo Earthquake Fault Zoning (APEFZ) Act, Public Resources Code (PRC), section 2621–2630 | Mitigates against surface fault rupture of known active faults beneath occupied structures. Requires disclosure to potential buyers of existing real estate and a 50-foot setback for new occupied buildings. Portions of the site and proposed ancillary facilities are located within designated Alquist-Priolo Fault Zones. The proposed site layout places occupied structures outside of the 50-foot setback zone. |
| The Seismic Hazards Mapping Act, PRC Section 2690–2699 | Areas are identified that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches. |
| PRC, Chapter 1.7, sections 5097.5 and 30244 | Regulates removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites. |
| Warren-Alquist Act, PRC, sections 25527 and 25550.5(i) | The Warren-Alquist Act requires the Energy Commission to “give the greatest consideration to the need for protecting areas of critical environmental concern, including, but not limited to, unique and irreplaceable scientific, scenic, and educational wildlife habitats; unique historical, archaeological, and cultural sites...” With respect to paleontological resources, the Energy Commission relies on guidelines from the Society for Vertebrate Paleontology, indicated below. |
| California Environmental Quality Act (CEQA), PRC sections 15000 et seq., Appendix G | Mandates that public and private entities identify the potential impacts on the environment during proposed activities. Appendix G outlines the requirements for compliance with CEQA and provides a definition of significant impacts on a fossil site. |
| Society for Vertebrate Paleontology (SVP), 1995 | The “Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontological Resources: Standard Procedures” is a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. The measures were adopted in October 1995 by the SVP, a national organization of professional scientists. |
| <u>Local</u> | |
| Riverside County General Plan, Safety Element | Adopts the Uniform Building Code (UBC) (1997), which provides design criteria for buildings and excavations. The UBC is superseded by the CBC (2007). Requires mitigation measures for geological hazards, including seismic shaking, surface rupture (adopts APEFZ Act), liquefaction, unstable soils and slopes, and flooding. |
| Riverside County General Plan, Multipurpose Open Space Element | Provides for ‘preservation of cultural, historical, archaeological, paleontological, geological and educational resources’. Also provides a map showing paleontological sensitivity in the county. |

D.2.4 PROPOSED PROJECT

D.2.4.1 SETTING AND EXISTING CONDITIONS

Applicant has applied for a right-of-way (ROW) grant for approximately 4,640 acres (7¼ square miles) currently administered by the BLM (GSEP 2009a). The property is divided into two elongate, roughly rectangular, unconnected portions along the northeast side of Chuckwalla Valley. The proposed GSEP would be constructed on approximately 1,800 acres (2¾ square miles) of the eastern portion, which is located north of Interstate Highway 10 and Ford Dry Lake roughly 23 miles west-southwest of the town of Genesis in Riverside County, California. An additional 90 acres will be utilized for off-site linear construction. Future power-generating facilities are presumably planned for construction on the western portion of the property, which is included in staff's current assessment.

The proposed GSEP would be a primary concentrated solar electric power generating facility capable of producing 250 megawatts (MW) of electricity from two independent plants (GSEP 2009a). Each plant will employ parabolic trough solar thermal technology, which utilizes an array of mirrors that focus solar energy towards a centralized power block. The power block contains a heat transfer fluid (HTF) which supplies heat to solar steam generators (SSG) that drive steam turbine generators (STG). Water for the project would be provided from ground water supply wells. The water would be treated to potable standards by an onsite packaged water treatment system, cooling water blow down would be disposed of by evaporation from lined ponds, and an on-site sanitary septic system would treat sewer waste water. On-site facilities associated with the solar plant would include control, warehouse and administration buildings, a bioremediation land treatment unit, raw, treated and deionized water storage tanks, HTF surge tanks, back-up diesel generators, cooling towers, and natural gas-fired auxiliary boilers. An access road, buried natural gas pipe line, and new 230 kilovolt (kV) electrical transmission line would occupy a 6.5-mile corridor extending from the southeast end of the GSEP site to Interstate 10. The generated electrical power from the Project switchyard will be transmitted through a generation-tie (gen-tie) line that will be routed in a southeasterly ROW eventually connecting to the proposed Southern California Edison (SoCal Edison) 500-230 kV Colorado River substation via the Blythe Energy Project Transmission Line (BEPTL)

Depending on the published reference, the proposed GSEP site is located in either the southeastern portion of the Mojave Desert geomorphic province (CGS 2002a), or the northeastern quarter of the Colorado Desert geomorphic province (Norris and Webb 1990), in the Mojave Desert of Southern California near the Arizona border. The region is more characteristic of the Mojave Desert geomorphic province in terms of geology, structure and physiography.

The Mojave Desert is a broad interior region of isolated mountain ranges which separate vast expanses of desert plains and interior drainage basins. The physiographic province is wedge-shaped, and separated from the Sierra Nevada and Basin and Range geomorphic provinces by the northeast-striking Garlock Fault on the northwest side. The northwest-striking San Andreas fault defines the southwestern boundary, beyond which lie the Transverse Ranges and Colorado Desert geomorphic provinces. The topography and structural fabric in the Mojave Desert is predominately southeast to

northwest, and is associated with faulting oriented similar to the San Andreas Fault. A secondary east to west orientation correlates with structural trends in the Transverse Ranges geomorphic province.

The proposed GSEP facility would be constructed on 1,800 acres (roughly 2¾ square miles) of land north of Interstate 10. The proposed site is located approximately 23 miles west-northwest of the town of Blythe, California, and about 24 miles east-southeast of the town of Desert Center in Riverside County, California. The proposed GSEP site would be situated on a broad alluvial plain within the northwest-trending Chuckwalla Valley between the McCoy Mountains to the northeast, the Palen Mountains to the northwest, and Ford Dry Lake to the south. Overall the proposed site slopes at very shallow grades south and southwest toward the local topographic low at Ford Dry Lake.

Quaternary age alluvial, lacustrine and eolian sedimentary deposits are mapped in the vicinity of the proposed GSEP site (CDMG 1967; USGS 1989; USGS 1990; USGS 2006; GSEP 2009a, c and f). Marine and transitional sediments of the Pliocene Age Bouse Formation are presumed to underlie alluvial fan deposits (USGS 1968; GSEP 2009a, c and f), and metasedimentary bedrock of the McCoy Mountains Formation outcrop in the McCoy and Palen Mountains (Harding and Coney 1985). The local stratigraphy as interpreted by numerous authors, is presented in **Geology and Paleontology Table 2**.

Geology and Paleontology Table 2
Correlation and Ages of Stratigraphic Units

| <u>Age</u> | <u>Unit/Description</u> | <u>Jennings (CDMG 1967)</u> | <u>Stone and Pelka (USGS 1989)</u> | <u>Stone (USGS 1990)</u> | <u>Stone (USGS 2006)</u> | <u>Worley Parsons (GSEP 2009f)</u> |
|---|---------------------------|-------------------------------------|--|----------------------------------|----------------------------------|--|
| Holocene | Eolian sands | Qs | Qs | Qs | Qs | Qyma |
| | Younger alluvium | Qal | Qya | QTa | Qa ₆ * | Qyva |
| | | | | | | Qyaf |
| | | | | | | Qiaf** |
| | Playa lake deposits | Ql | Qp | Qp | Qp | Qp |
| Pleistocene | Older alluvium | Qc | Qia | QTa | Qa ₃ | Qoaf |
| | | | Qoa | | | |
| Pliocene ± Miocene | Bouse Formation | Pu | Not Mapped | Tbs/Tbt | Tbs, Tbt | Not Mapped |
| Cretaceous | McCoy Mountains Formation | ms | Km(x), KJm(x) | Kjmlu, Km(x) | Km(x) | Not Mapped |
| * - Interpreted as mid-Holocene in age based on suggested age of ancient shoreline, and moderate development of desert varnish and pavement ** - Transitional between older, dissected alluvial fan deposits and younger sediments in a depositional setting | | | | | | |

Holocene units, which include eolian sands, younger alluvium, and playa lake deposits, are mapped over nearly the entire proposed GSEP site surface. Eolian sands consist of unconsolidated deposits of well sorted, wind blown sand in dunes and sheets. Younger alluvium is composed of sand, pebbly sand and sandy pebble-gravel, and is generally coarser grained closer to mountain ranges. Desert varnish is not well developed in the mostly unconsolidated and undissected sediments. Playa lake deposits are also unconsolidated, and are comprised of clay, silt and sand. Older alluvium is present at the surface along the northern edge of both the western (entire length) and eastern (west end only) portion and the proposed GSEP site. The exposures of older alluvium occur as north-south oriented ridges of material protruding into the site from the north, with the intervening areas occupied by drainages filled with younger alluvium. Older alluvium is composed of consolidated gravel and sand that is moderately dissected with moderately developed desert pavement and varnish.

The approximate transition from Pleistocene to Holocene age sediments is marked by the change from older alluvium with an erosional, dissected surface, to a setting in which neither deposition nor erosion is occurring (intermediate alluvium), to areas undergoing active fan deposition (younger alluvium) (GSEP 2009f). A prominent east-west-trending linear feature observed on aerial photos that roughly corresponds to this transitional area is interpreted to be an ancient shoreline. Although the age of the shoreline is not well established, it is postulated in the Geological Resources and Hazards section of the AFC (GSEP 2009a) that the pluvial highstand of Ford Lake could have occurred approximately 4000 years before present (bp). This suggests a Holocene age of deposition for intermediate alluvium (Qiaf, Unknown Reference, GSEP 2009a), which is shown in areas mapped as younger alluvium by others (Qa1, CDMG 1967; Qva, USGS 1989; and Qa₆, USGS 2006).

Interbedded clay, silt, sand, limestone and tufa of the Bouse Formation were deposited in a marine to brackish-water environment during the Pliocene epoch in Coachella Valley (USGS 1968; USGS 2006). The sediments were deposited in a marine embayment of the Gulf of California that encroached northward into the Colorado River valley during the late Tertiary. The nearest exposure relative to the proposed GSEP site is mapped at the north end of the Mule Mountains approximately 8 miles southeast of the southeastern end of the project linears (USGS 1968). The geotechnical investigation attached to the AFC indicates that the unit underlies the proposed site at a depth of 245 to 275 feet beneath Quaternary alluvium, and extends several thousand feet (GSEP 2009a). Weakly metamorphosed sandstone and conglomerate, and lesser shale, mudstone and siltstone, of the Cretaceous age McCoy Mountains Formation are the predominant lithologies in the McCoy and Palen Mountains (CDMG 1967; USGS 1968; USGS 1990; USGS 2006). The nearest exposures are located roughly 2½ miles north of the western portion of the property in the Palen Mountains and 3 miles northeast of the project linears in the McCoy Mountains.

One reverse circulation drill hole was advanced to a depth of 900 feet for the preliminary geotechnical investigation attached to the AFC (GSEP 2009f). The drill hole was located at the east end of the western portion of the GSEP site, approximately 1.5 miles from the western limit of proposed construction on the eastern portion of the site. The upper 12 feet of the drill hole consisted of gravelly sand with silt that contained 16 to 17 percent fines passing the number 200 sieve. Between 12 and 75 feet (limit of presented

data), the soils consisted of interbedded silty sand, clayey sand, sandy lean clay and fat clays interpreted to have been deposited in alternating alluvial and lacustrine environments. Penetration resistance blow counts, obtained by driving a Modified California split spoon sampler at regular intervals in the upper 75 feet of the drill hole, indicate the consistency of the site soils are very dense or very hard (GSEP 2009f). A summary of laboratory testing in the preliminary geotechnical investigation reported plasticity indices for the clay soils that range from 23 to 39, and free swells ranging from 130 to 270 percent (GSEP 2009f). The test results indicate the clay soils are moderately to highly expansive. The upper 12 feet of granular materials is considered to be younger alluvium, and underlying granular and clay soils are interpreted to be older alluvial fan and lacustrine deposits (GSEP 2009f). The depth to older alluvium beneath younger alluvium across the portion of the GSEP site proposed for construction, however, is unknown and likely varies greatly. Shallow excavations encountered weakly carbonate-cemented sediments and soil development, which could be intermediate or older alluvium, at depths just beneath 18 inches below the surface (GSEP 2009f). This suggests that only a thin veneer of younger alluvium may be present locally, or in large areas, across the proposed site.

Geophysical testing, which included seismic refraction, electromagnetic soundings, and surface and down hole shear wave velocity profiles, were also conducted in the vicinity of proposed construction. Depth to ground water and the top of the Bouse Formation, relative density of the alluvial soils, and the project location site class (CBC 2007), were estimated using geophysical methods.

The proposed GSEP plant site is not crossed by any known active faults or designated Alquist-Priolo Earthquake Fault Zone (EFZ, formerly called Special Studies Zones) (CGS 2002b). A number of major, active faults lie within 62 miles of the site. These faults are discussed in detail under the **Geological Hazards** section later in this section. Several northwest-striking, south-dipping basement thrust faults are mapped at the extreme south ends of the Palen and McCoy Mountains, and are inferred beneath Quaternary and Tertiary sediments in Chuckwalla Valley (Harding and Coney 1985; CDMG 1967; USGS 1990; USGS 2006). The faults are part of a major Mesozoic terrain-bounding structural zone that was active during late Jurassic time, and are associated with folding and metamorphism of the McCoy Mountains Formation. The basement faults are no longer active, and are not exposed anywhere on the surface of the proposed site.

The site-specific geotechnical investigation performed for the proposed GSEP (GSEP 2009a) estimated a depth to the ground water table of 61 to 81 feet below the surface in the vicinity of proposed construction, based on geophysical methods. Ground water was encountered at approximately 77 feet below ground surface (bgs) in the reverse circulation drill hole 1.5 miles west of proposed construction. Water level monitoring at wells 006S019E28R001S, 006S019E32K001S, and 006S019E32K002S, located 1½ to 4½ miles southwest of the eastern portion of the proposed site near Ford Dry Lake, yielded water levels of 81 to 110 bgs feet from 1992 to 2000 (CDWR 2009; USGS 2009). Measured ground water levels at the southeast end of the proposed project linears ranged from 125 to 151 feet bgs between 1979 and 2002 in wells 006S020E33C001S, 006S020E33L001S, and 007S04E33R001S. Water levels beneath the site would vary seasonally and with pumping frequency of nearby irrigation wells.

Existing grade at the proposed power plant site slopes between 0.5 and 1.5 percent to the south and southwest towards Ford Dry Lake. Site drainage is probably by a combination of infiltration, overland sheet flow and shallow drainages. A more complete discussion of on-site drainage is included in the **Water Resources** section of this staff assessment

D.2.4.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section considers two types of impacts. The first is geological hazards, which could impact the proper functioning of the proposed facility and create life/safety concerns. The second is the potential impacts the proposed facility could have on existing geological, mineralogical, and paleontological resources in the area.

D.2.4.2.1 Direct/Indirect Impacts and Mitigation

Ground shaking, expansive soils, and hydrocompaction represent the main geological hazards at the proposed site. These potential hazards could be effectively mitigated through facility design by incorporating recommendations contained in the project geotechnical evaluation. Proposed Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **Facility Design** section should also mitigate these impacts to a less than significant level.

The proposed GSEP site is located within Mineral Resource Zone 4 (MRZ-4), which denotes “areas of no known mineral occurrences where geological information does not rule out either the presence or absence of significant mineral resources” (CDMG 1994a). No economically viable mineral deposits are known to be present at the site (CDMG 1994a; Kohler 2006). Many inactive mines and mineral prospects are hosted by in metamorphic and intrusive basement rocks within 10 miles of the proposed project boundaries and project linears. These have produced a number of precious and base metals, including iron (magnetite) from the Iron King, Iron Queen and Iron Cap mines in the Palen Mountains 1½ to the north (CDMG 1994a). Minor gold, silver, copper and uranium prospects are located in the Palen Mountains 2½ miles to the north, and in the McCoy Mountains 4½ miles to the east. The Roosevelt and Hodge Mining Districts produced gold and silver from quartz veins and shear zones in the Mule Mountains approximately 6 to 9 miles southeast of the proposed project linears. Pyrophyllite, an industrial mineral used in the manufacturing of dry lubricants, paper, rubber, fabric and soap, has been mined from the Palen Mountains 3½ miles north of the site. Several borrow pits are present along Interstate 10. No mines are known to have existed within the proposed project boundaries (USGS 2008b).

Near-surface geology beneath the proposed GSEP site consists primarily of Quaternary alluvium, eolian and lacustrine sediments which increases in age with depth from Holocene at the surface to Pleistocene and older at depth (CDMG 1967; USGS 1989; USGS 1990; USGS 2006). Coarse-grained sediments grade laterally and are likely interbedded with lakebed deposits of similar ages to the south and southwest towards Ford Dry Lake. Pleistocene age older alluvium, which is exposed along the northern boundary of the site, underlies younger alluvium and lacustrine sediments. Pleistocene age deposits may be within a few feet of the surface along the northern border, and at an unknown but progressively deeper depth to the south across the proposed site and

project linears. Pliocene age marine and transitional sediments of the Bouse Formation underlie Quaternary deposits at depths of 245 to 275 feet, but are not exposed at the surface (GSEP 2009a). Similarly, metamorphosed sediments of the Cretaceous age McCoy Mountains Formation make up nearly all basement rocks in the McCoy and Palen Mountains (CDMG 1967; USGS 1968; USGS 1990; USGS 2006), but are not present on the proposed site.

Staff reviewed correspondence from the NHMLA (McLeod, 2009), the UCMP, and the Riverside County Land Information System (RCLIA 2009), for information regarding known fossil localities and stratigraphic unit sensitivity within the proposed project area. The paleontological resources section of the AFC (GSEP 2009a) indicates there are no recorded fossil collection sites within the proposed project boundaries based on reports submitted by the NHMLA or the UCMP. The only known fossil remains on the proposed site and project linears were observed during a four-day field survey. Fragments of tortoise carapace and bones, which were partly replaced with calcite, gypsum and opaline silica, were found in stream beds. The fragmental condition indicates the specimens were transported a significant distance to their current location, probably post-mortem, and the mineralization suggests an age on the order of several thousand years (GSEP 2009a). Microfossils, including diatoms and ostracods, were also found in sediments during a preliminary field survey. The paleontological assessment report concludes that fossils observed on the proposed site are indicative of late Pleistocene/early Holocene environment, and that there is only limited potential for the observed specimens to add to the current body of scientific knowledge. It should be noted that *“a complete pedestrian survey of the entire Project area of potential effect for paleontological resources was considered unnecessary and no subsurface exploration was conducted. A more detailed survey was considered unnecessary because the Project site is located in a lowland, depositional environment consisting of the surface of very recent Holocene alluvium”* (GSEP 2009a).

Several fossil localities have been documented by the NHMLC in the local region in geological units that may be encountered during construction of the proposed GESP site (McLeod 2009). The nearest is a pocket mouse specimen recovered from lacustrine sediments in the southwest part of the Ford Dry Lake, within roughly 4 miles southwest of proposed construction. A site in older alluvium approximately 20 to 25 miles to the northwest has produced fossil remains of tortoise, horse and two species of camel.

Based on the recorded fossil finds, staff concludes the paleontological resource sensitivity of Quaternary age sediments varies from low in Holocene age younger alluvial, lacustrine and eolian deposits at shallow depths to high as Pleistocene age older alluvium and lacustrine deposits are encountered at deeper depths. The depth to Pleistocene age sediments is unknown and may vary significantly across the site. Older alluvium is mapped at the surface along the northern border of the site, and would likely be buried at progressively deeper depths beneath Holocene sediments southward across the site. The geomorphic reconnaissance report for the proposed project encountered a weathered horizon that may be older alluvium within only two or three feet of the surface beneath younger alluvium (GSEP 2009f). McLeod (2009) indicated that older lacustrine deposits may be encountered in excavations along the southwest margins of the site nearest Ford Dry Lake.

The Riverside County Transportation and Land Management Agency (TLMA) has produced a paleontological sensitivity map of the county (RCLIS 2009). The mapping indicates that areas underlain by playa lake, eolian and younger alluvial deposits within and around the Ford Dry Lake basin have a high paleontological sensitivity rating. Younger alluvium upslope from the lakebed has a low sensitivity rating, and older alluvium is assigned an undetermined sensitivity rating, according to the TLMA.

Staff concludes that all subsurface older Quaternary age alluvial and lacustrine sediments are highly sensitive. Where these units are mapped at the surface or may be present near the surface adjacent to these mapped areas, specifically along the northern and southern (adjacent to Ford Dry Lake) borders of the proposed GESP site, paleontological monitoring should be conducted for any excavation from the surface. Since the depth to Pleistocene age alluvial and lacustrine deposits is undetermined at present for the remainder of the site, any excavations that penetrate below 1.5 feet of the existing ground surface should be treated as having a high potential for impacting significant paleontological resources and would require paleontological monitoring. This depth is based on observations of possible older alluvium encountered in excavations advanced for the geomorphic reconnaissance report (GSEP 2009f).

As monitoring of grading and trenching activities during proposed construction of the site progresses, a qualified professional paleontologist may determine a more appropriate depth above which the coarse and fine grained soils are Holocene in age, have a low sensitivity, and low potential for adverse impacts on paleontological resources. This depth would likely increase from the northern and southern boundaries towards the center of the proposed GESP site. Recommendations for increased, decreased, or unchanged levels of monitoring could be proposed as well based on increased information and experience gained as proposed construction progresses.

The Pliocene age Bouse Formation is known to have produced fossil specimens in the Colorado River Valley area (USGS 1968). However, the unit is not exposed at the surface of the proposed site, and a minimum depth of 245 feet bgs was determined in the project geotechnical investigation (GSEP 2009a). Similarly, bedrock present in the McCoy Mountains Formation is expected to lie at even greater depths beneath the site, and metamorphic rocks are generally considered to have little or no potential for containing significant fossil remains. Therefore, staff considers the potential for impacting significant paleontological resources in the Bouse and McCoy Mountains Formations during proposed construction to be minimal.

Staff considers the probability for significant paleontological resources to be encountered during proposed site construction activities to be low in Holocene age deposits on most of the proposed GSEP site surface. However, proposed mass grading, deep foundation excavation and utility trenching may penetrate underlying Pleistocene age soils at undetermined depths, particularly in the northern portions of the site. Overall, the potential for exposure of paleontological resources would be considered as high, until determined otherwise by a qualified professional paleontologist. Low and high paleontological sensitivity roughly corresponds to PYFC Condition 3, Class 1 or 2 and Condition 2, Class 4a and 4b, respectively.

This assessment is based on SVP (1995) criteria and the paleontological report appended to the AFC (GSEP 2009a). Proposed Conditions of Certification **PAL-1** to **PAL-7** are designed to mitigate paleontological resource impacts, as discussed above, to less than significant levels. These conditions essentially require a worker education program in conjunction with the monitoring of earthwork activities by a qualified professional paleontologist (a paleontological resource specialist, or PRS).

The proposed conditions of certification allow the BLM Authorized Office and the Energy Commission's CPM and the applicant to adopt a compliance monitoring scheme ensuring compliance with LORS applicable to geological hazards and the protection of geological, mineralogical, and paleontological resources.

Based on the information below, it is staff's opinion that the potential for significant adverse, direct or indirect impacts to the project, from geological hazards, and to potential geological, mineralogical, and paleontological resources, from the proposed project, is low.

Geological Hazards

The AFC provides documentation of potential geological hazards at the proposed GSEP plant site, including some site-specific subsurface information (GSEP 2009a). Review of the AFC, coupled with staff's independent research, indicates that the potential for geological hazards to impact the proposed plant site during its practical design life would be low if recommendations for mitigation of seismic shaking, expansive soils, and hydrocompaction are followed. Geological hazards should be addressed in a project-specific, design-level geotechnical report per CBC (2007) requirements (GSEP 2009a).

Staff's independent research included the review of available geological maps, reports, and related data of the proposed GSEP plant site. Geological information was available from the California Geological Survey (CGS), California Division of Mines and Geology (CDMG, now known as CGS), the U.S. Geological Survey (USGS), the American Geophysical Union, the Geological Society of America, the Southern California Earthquake Data Center (SCEDC), and other organizations.

Faulting and Seismicity

Energy Commission staff reviewed numerous CGS, CDMG and USGS publications as well as informational websites in order to gather data on the location, recency, and type of faulting in the proposed project area. Type A and B faults within 63 miles (100 kilometers) of the proposed GSEP site are listed in **Geology and Paleontology Table 3**. Type A faults have slip-rates of ≥ 5 mm per year and are capable of producing an earthquake of magnitude 7.0 or greater. Type B faults have slip-rates of 2 to 5 mm per year and are capable of producing an earthquake of magnitude 6.5 to 7.0. The fault type, potential magnitude, and distance from the site are summarized in **Geology and Paleontology Table 3**. Because of the large size of the proposed site the distances to faults are measured from a point between the two proposed power blocks within the site.

Geology and Paleontology Table 3
Active Faults Relative to the Proposed Genesis Solar Energy Project Site

| <u>Fault Name</u> | <u>Distance from Site (miles)</u> | <u>Maximum Earthquake Magnitude (Mw)</u> | <u>Estimated Peak Site Acceleration (g)</u> | <u>Fault Type and Strike</u> | <u>Fault Class</u> |
|------------------------|-----------------------------------|--|---|---------------------------------------|--------------------|
| Brawley Seismic Zone | 47.5 | 6.4 | 0.058 | Right-Lateral Strike Slip (Northwest) | A |
| San Andreas: Coachella | 47.6 | 7.2 | 0.089 | Right-Lateral Strike Slip (Northwest) | A |
| San Andreas: Whole | 47.6 | 8.0 | 0.136 | Right-Lateral Strike Slip (Northwest) | A |
| Elmore Ranch | 49.6 | 6.6 | 0.063 | Left-Lateral Strike Slip (Northeast) | B |
| Pinto Mountain | 61.8 | 7.2 | 0.073 | Left-Lateral Strike Slip (East-West) | B |
| Imperial | 62.9 | 7.0 | 0.064 | Right-Lateral Strike Slip (Northwest) | A |

Other Type C and otherwise undifferentiated faults which are more than 20 miles from the proposed site are not discussed here because they are unlikely to undergo movement or generate seismicity which could affect the project.

Six Type A and B faults and fault segments were identified within 63 miles of the proposed GSEP site (**Geology and Paleontology Table 3**). Of these, none are within 45 miles of the site. Four of the faults are Type A right-lateral, northwest-trending strike-slip fault systems that are subparallel to the San Andreas Fault System. The remaining two faults are Type B, are east-west to northeast striking, and are left-lateral strike-slip faults with characteristics similar to the Garlock Fault, which bounds the northwestern side of the Mojave Desert geomorphic province (CGS 2002a). All fault zones in **Geology and Paleontology Table 3** lie within designated Alquist-Priolo Earthquake Fault Zones (CDMG 2003)

The proposed GSEP site is located just southwest of the Mojave-Sonoran Belt a roughly 60-mile-wide structural belt that has been correlated with the southern extension of the Walker Lane Fault Zone (USGS 1991). The western boundary for the structural zone, located 5 to 10 miles northeast of the proposed site, is marked by an abrupt termination of north- and northeast-trending mountain ranges and basins to the east that are characteristic of the San Andreas Fault Zone, and northwest-trending strike-slip faulting to the west. The Mojave-Sonoran Belt is notable for its relative lack of seismicity and recent faulting (USGS 1991). The region has experienced a low frequency of Pliocene faulting, and Pleistocene faults are nearly absent. These characteristics are unusual given its proximity to areas of intense faulting and frequent seismicity, such as the Eastern California Shear Zone (Dokka and Travis 1990) to the northwest and the Salton Trough to the west.

All of the faults listed in **Geology and Paleontology Table 3** could generate some level of ground shaking at this site. Since there are no known faults of any age through the site, the potential for actual seismic ground surface rupture is negligible.

The close proximity of the proposed GSEP site to the Mojave-Sonoran belt and relatively great distance from more seismically active areas to the west and northwest would suggest a relatively low to moderate probability of intense ground shaking in the project area. However, events such as the Landers earthquake (7.6 Mw), which

occurred on June 28, 1992 approximately 90 miles from the proposed site (Blake 2000b), demonstrate that the proposed site could be subject to moderate levels of earthquake-related ground shaking in the future. The effects of ground shaking would need to be mitigated, to the extent practical, through structural designs required by the California Building Code (CBC 2007) and a site-specific project geotechnical report.

The estimated bedrock peak horizontal ground acceleration (Site Class B) for the power plant is 0.20 times the acceleration of gravity (0.20g) (USGS 2008a). Based on weight averaged down hole shear wave velocities of 1210 feet/sec, and supported by Modified California penetration resistance blow counts, the soils at the proposed GSEP site were determined to be Site Class C (CBC 2007; GSEP 2009f). Buildings and structures are required to be designed with adequate strength to resist the effects of Design Earthquake Ground Motion, as defined by the CBC (2007). This motion is calculated using the site classification, occupancy categories and site coefficients, which in turn are used to determine the design spectral response acceleration parameters at short and 1-second periods. These parameters are generally provided in the design-level geotechnical report for the specific project site.

The potential for strong ground shaking will be addressed in proposed Facility Design Condition of Certification **GEN-1**. Proper design in accordance with this condition, as well as with requirements presented in the site-specific, design-level geotechnical evaluation, should adequately mitigate seismic hazards to the current standards of practice.

Liquefaction

Liquefaction is a condition in which a saturated cohesionless soil may lose shear strength because of sudden increase in pore water pressure caused by an earthquake. However, the potential for liquefaction of strata deeper than approximately 40 feet below surface is considered negligible due to the increased confining pressure and because geological strata at this depth are generally too compact to liquefy.

The preliminary geotechnical investigation at the proposed site estimated current depths to ground water determined by geophysical methods and supported by a single boring 1.5 miles west of proposed construction ranges from 61 to 81 feet bgs (GSEP 2009f). Ground water levels recorded in the nearest wells south of the site and in the vicinity of the southern end of the project linears range from 81 to 151 feet bgs (CDWR 2009; USGS 2009). The geotechnical report also indicated that the granular soils encountered in borings were generally very dense. Because the ground water table is greater than 40 feet deep across the property, and the shallow granular soils are very dense, the potential for liquefaction-induced settlement beneath the site during moderate seismic events is considered to be very low. Measures to mitigate significant damage due to liquefaction should be presented in a design-level, site-specific geotechnical report. Liquefaction potential on the proposed GSEP site is also addressed in the proposed Condition of Certification **GEN-1** requirements.

Lateral Spreading

Lateral spreading of the ground surface can occur within liquefiable beds during seismic events. Lateral spreading generally requires an abrupt change in slope—that is, a

nearby steep hillside or deeply eroded stream bank. Other factors such as distance from the epicenter, magnitude of the seismic event, and thickness and depth of liquefiable layers also affect the amount of lateral spreading. Because the proposed GSEP site is not subject to catastrophic liquefaction-induced settlement, the potential for lateral spreading during seismic events would be negligible due to the low relief and very shallow slopes at the proposed site surface. Lateral spreading potential on the proposed GSEP site should be addressed in a design-level project geotechnical report per CBC (2007).

Dynamic Compaction

Dynamic compaction of soils results when relatively unconsolidated granular materials experience vibration associated with seismic events. The vibration causes a decrease in soil volume, as the soil grains tend to rearrange into a more dense state (an increase in soil density). The decrease in volume can result in settlement of overlying structural improvements. The preliminary geotechnical investigation indicates there would be a potential for minor and localized dynamic compaction during an earthquake (GSEP 2009f). The final geotechnical site evaluation should further investigate the potential for dynamic compaction within the proposed project site and along its linears and, if necessary, provide design parameters necessary to mitigate dynamic compaction issues.

Hydrocompaction

Hydrocompaction (also known as hydro-collapse) is generally limited to young soils that were deposited rapidly in a saturated state, most commonly by a flash flood. The soils dry quickly, leaving an unconsolidated, low density deposit with a high percentage of voids. Foundations built on these types of compressible materials can settle excessively, particularly when landscaping irrigation dissolves the weak cementation that is preventing the immediate collapse of the soil structure. The initial site geotechnical investigation indicates that subsurface alluvial deposits which underlie the proposed project linears contain soils that may experience hydrocompaction (GSEP 2009f). The final geotechnical site evaluation should further investigate the potential for hydrocompaction within the proposed project site and along its linears and, if necessary, provide design parameters necessary to mitigate hydrocompaction issues.

Subsidence

The Riverside County General Plan indicates the basin fill sediments in Chuckwalla Valley are susceptible to subsidence (RCLIA 2008; GSEP 2009f). Regional ground subsidence is typically caused by petroleum or ground water withdrawal that increases the effective unit weight of the soil profile, which in turn increases the effective stress on the deeper soils. This results in consolidation or settlement of the underlying soils. However, even during the 1980's and 1990's when regional ground water extraction was at its historic maximum of approximately 48,000 acre-feet per year (AFY) no localized or regional subsidence was recorded. Current ground water withdrawals are reportedly only approximately 2,000 AFY and even the proposed project demand of an additional 1,600 AFY will not approach historic pumping demands. In addition, no petroleum or natural gas withdrawals are taking place in the proposed site vicinity. Therefore, the potential for local or regional ground subsidence resulting from petroleum, natural gas, or ground water extraction is considered to be very low.

Local subsidence or settlement may also occur when areas containing compressible soils are subjected to foundation or fill loads. The relative density of site granular soils was determined to be very dense based on available penetration resistance blow counts in the preliminary geotechnical investigation (GSEP 2009f). Very dense soils are unlikely to experience significant subsidence due to foundation loading.

Expansive Soils

Soil expansion occurs when clay-rich soils with an affinity for water exist in place at a moisture content below their plastic limit. The addition of moisture from irrigation, precipitation, capillary tension, water line breaks, etc. causes the clay soils to absorb water molecules into their structure, which in turn causes an increase in the overall volume of the soil. This increase in volume can correspond to excessive movement (heave) of overlying structural improvements. The preliminary geotechnical evaluation indicates near-surface soils at the proposed site are composed of granular soils with a low content of non-plastic fines, which are not considered to be expansive (GSEP 2009a). However, expansive clay soils were encountered at relatively shallow depths in the single boring located 1.5 miles west of proposed construction and could be present at shallow depths beneath the site. A site-specific, design-level geotechnical site investigation would further evaluate the presence of expansive soils within the proposed project site and along its linears and, if necessary, will provide routine design recommendations to mitigate expansive soil issues (GSEP 2009a).

Landslides

Due to the low site gradient and the absence of topographically high ground in the site vicinity, the potential for landslide impacts to the site is considered to be negligible.

Flooding

The proposed GSEP area has not been mapped by the Federal Emergency Management Agency for flood potential (FEMA 2009). Because the proposed site is topographically higher than Ford Dry Lake to the south, it is staff's opinion that the potential for flooding at the site is limited to infrequent high volume (flash flood) events which may occur due to heavy rainfall in the Palen and McCoy Mountains northeast and northwest of the site. Storm waters would be carried across the proposed site from roughly north to south via existing drainages. Site drainage would be modified during project construction to mitigate potential impacts due to catastrophic flooding (GSEP 2009a).

Tsunamis and Seiches

The proposed GSEP site and associated linear facilities are not located near any significant surface water bodies, and therefore the potential for impacts due to tsunamis and seiches is considered to be negligible.

Volcanic Hazards

The proposed GSEP site is located approximately 42 miles west of the Lavić Lake volcanic hazard area (VHA), an approximately 14 square mile area within the Mojave Desert comprised of Miocene to Holocene age dacitic to basaltic flows, pyroclastic rocks, and volcanoclastic sediments (Glazner et al. 2000). The Lavić Lake VHA has

been designated by the USGS as an area subject to lava flows and tephra deposits associated with basalt or basaltic andesite vents (Miller 1989). The Amboy Crater – Lavic Lake VHS is also considered to be subject to future formation of cinder cones, volcanic ash falls, and phreatic explosions. The recurrence interval for eruptions has not been determined, but is likely to be in the range of one thousand years or more. Because the proposed GSEP site is not located within a designated volcanic hazard area, staff considers the likelihood of significant impacts to the project resulting from volcanic activity would be low.

Geological, Mineralogical, and Paleontological Resources

Geological and Mineralogical Resources

Staff has reviewed applicable geological maps, reports, and on-line resources for this area (Blake 2000a and b; CDMG 1990; CDMG 1994a and b; CDMG 1998; CDMG 1999; CDMG 2003; CGS 2002a, b and c; CGS 2007; Jennings and Saucedo 2002; SCEDC 2008; USGS 2003; USGS 2008a and b). Staff did not identify any geological or mineralogical resources at the proposed GSEP facility location.

The proposed GSEP site is located within MRZ-4 and no economically viable mineral deposits are known to be present (CDMG 1994a; Kohler 2006). Numerous mines and mineral prospects, which have produced iron, gold, silver, copper, uranium, and pyrophyllite, are present within 10 miles of the proposed project. No mines are known to have existed within the proposed project boundaries (USGS 2008b).

Paleontological Resources

Staff reviewed the Paleontological Resources Assessments in Section 5.9 and Appendix E of the AFC (GSEP 2009a). Staff has also reviewed paleontological literature and records searches conducted by the NHMLA (McLeod 2009) and the UCMP. These reports document several recorded fossil localities in Holocene to Pleistocene age alluvium and lakebed sediments on and within 25 miles of the proposed GSEP site. Based on these recorded fossil finds and the age of the sediments which may be encountered during construction, the paleontological resource sensitivity of undisturbed Quaternary alluvium and lacustrine sediments varies from low at shallow depths to high at deeper depths. The depth to Pleistocene age sediments beneath Holocene deposits is unknown for most of the proposed site. Staff concludes that all sedimentary units below a depth of 1.5 feet of the ground surface where Holocene age sediments are mapped should initially be treated as highly sensitive. Where Pleistocene age deposits are mapped along the northern and southern borders, staff considers the highly sensitive sedimentary units to be present at the surface. Highly sensitive roughly corresponds to PYFC Condition 2, Class 4a or 4b. After monitoring of grading and trenching activities during proposed construction of the site, a qualified professional paleontologist may determine the appropriate depth above which the coarse grained soils are Holocene in age, have a low sensitivity, and low potential for adverse impacts on paleontological resources (PYFC Condition 3, Class 1 or 2).

These conclusions are based on SVP criteria, the Paleontological Resource Assessments in the AFC (GSEP 2009a), and the independent records searches and paleontological review provided by McLeod (2009) and the UCMP. Proposed Conditions

of Certification **PAL-1** to **PAL-7** are designed to mitigate paleontological resource impacts, as discussed above, to less than significant levels. These conditions would essentially require a worker education program in conjunction with the monitoring of earthwork activities by a qualified professional paleontologist (a paleontological resource specialist, or PRS).

The proposed conditions of certification would allow the BLM Authorized Office, the Energy Commission's CPM, and the applicant to adopt a compliance monitoring scheme ensuring compliance with LORS applicable to geological hazards and the protection of geological, mineralogical, and paleontological resources.

D.2.4.2.2 Construction Impacts and Mitigation

The design-level geotechnical evaluation, required for the project by the CBC (2007) and proposed Condition of Certification **GEN-1** should provide standard engineering design recommendations for mitigation of earthquake ground shaking, expansive soils, and hydrocompaction (see **Proposed Conditions of Certification, Facility Design**).

As noted above, no viable geological or mineralogical resources are known to exist in the vicinity of the proposed GSEP site. Construction of the proposed project will include grading, foundation excavation, and utility trenching. Based on the soils profile, SVP assessment criteria, and recorded fossil localities within 25 miles of the proposed site, staff considers the probability of encountering paleontological resources to be negligible in the upper 1.5 feet of most of the site. Sediments at the surface along the northern and southern borders of the site, as well as all sediments below 1.5 feet of the remainder of the site, should be treated as highly sensitive (PYFC Condition 2, Class 4a, 4b).

Proposed Conditions of Certification **PAL-1** to **PAL-7** are designed to mitigate any paleontological resource impacts, as discussed above, to a less than significant level. Essentially, Conditions of Certification **PAL-1** to **PAL-7** would require a worker education program in conjunction with monitoring of earthwork activities by qualified professional paleontologists (paleontological resource specialist, or PRS). Earthwork would be halted any time potential fossils are recognized by either the paleontologist or the worker. For finds deemed significant by the PRS, earthwork cannot restart until all fossils in that strata, including those below the design depth of the excavation, are collected. When properly implemented, the conditions of certification would yield a net gain to the science of paleontology since fossils that would not otherwise have been discovered can be collected, identified, studied, and properly curated. A paleontological resource specialist would be retained, for the project by the applicant, to produce a monitoring and mitigation plan, conduct the worker training, and provide the monitoring.

During the monitoring, the PRS can and often does petition the Energy Commission for a change in the monitoring protocol. Most commonly, this is a request for less monitoring after sufficient monitoring has been performed to ascertain that there is little chance of finding significant fossils. In other cases, the PRS can propose increased monitoring due to unexpected fossil discoveries or in response to repeated out-of-compliance incidents by the earthwork contractor. In the case of the GSEP site, the PRS would determine an appropriate depth above which undisturbed alluvial and

lacustrine sediments are Holocene in age, have a low paleontological sensitivity, and have little chance of containing significant fossils. The PRS could then recommend decreased monitoring for excavations above that depth. Paleontological sensitivity of Pleistocene age sediments below the determined depth would remain high and would require continued monitoring.

Based upon the literature and archives search, field surveys, and compliance documentation for the proposed GSEP, the applicant has proposed monitoring and mitigation measures to be followed during the construction of the project. Energy Commission staff agrees with the applicant that the facility can be designed and constructed to minimize the effect of geological hazards and impacts to potential paleontological resources at the site during project design life.

D.2.4.2.3 Operation Impacts and Mitigation

Operation of the proposed new solar energy generating facility should not have any adverse impact on geological, mineralogical, or paleontological resources.

D.2.4.2.4 Project Closure and Decommissioning

The future decommissioning and closure of the project should not negatively affect geological, mineralogical, or paleontological resources since the ground disturbed during plant decommissioning and closure would have been already disturbed, and mitigated as required, during construction and operation of the project.

D.2.4.3 CEQA LEVEL OF SIGNIFICANCE

CEQA and NEPA guidelines strive to assure projects on public lands will not:

- Block access to a geological or mineralogical resource, a source of industrial minerals, or construction aggregates.
- Damage, destroy or block access to a natural geological feature with aesthetic and/or scientific value.
- Damage, destroy, or block access to a significant paleontological resource (primarily but not always, vertebrate fossils).
- Increase or initiate regional ground subsidence through extraction of ground water, petroleum, or natural gas.
- Construct structures that would be dangerous to workers or the general public as the result of natural geological hazards of the site.

Independent research conducted by CEC staff geologists verifies that there are no known geological or mineralogical resources or unusual geological features near or within the boundary of the proposed GSEP site. The CEQA level of significance from these areas of concern is “no impact.” Since major ground water withdrawal is not anticipated and regional subsidence is not a known geological hazard in this area, staff concludes that ground water withdrawal for this project would result in an impact of “less than significant.”

All structures on this site must be constructed to the standards of the current California Building Code (CBC 2007), as specified in proposed Condition of Certification **GEN-1** under **Facility Design**. The building code standards are based on both theoretical design and observation of component failures over many years. The intent of the building code is to minimize the risk to human life from natural hazards, including those inherent in the geological environment (earthquake-related, landslides, tsunamis/seiches, volcanic eruptions) and those from other sources, primarily high wind loading. Implementation of these design standards, per **GEN-1**, should result in geological hazards being “less than significant with mitigation” (mitigation being proper design for the site-specific hazards).

Energy Commission staff concludes that the GSEP site is situated in a geological environmental with a high potential to encounter significant paleontological resources, particularly in deeper excavations required for the large structures. Potential impacts to paleontological resources, within the proposed project, can be mitigated to a (CEQA) less than significant level by adopting and enforcing the proposed Conditions of Certification **PAL-1** through **PAL-7**.

D.2.5 REDUCED ACREAGE ALTERNATIVE

The Reduced Acreage Alternative would essentially be Unit 1 of the proposed project, including a 125 MW solar facility located within the boundaries of the proposed project as defined by NextEra. This alternative is analyzed for two major reasons: (1) it eliminates about 50 percent of the proposed project area so impacts are reduced, and (2) by eliminating the eastern solar field, which is located on flowing desert washes, it would reduce impacts to the sand dune and playa areas and to the Mojave Fringe-toed Lizard habitat. The alternative would also reduce impacts to wildlife movement by reducing obstruction of the Palen wash and would maintain, thru both fluvial and Aeolian processes, the dune and sandy habitats. The boundaries of the Reduced Acreage Alternative are shown in **Alternatives Figure 1**.

D.2.5.1 SETTING AND EXISTING CONDITIONS

This alternative is located entirely within the boundaries of the proposed project. It simply eliminates effects to the eastern 125 MW solar field and relocates the gas yard approximately 1.75 miles northwest of its present location. As a result, the environmental setting consists of the western portion of the proposed project, as well as the area affected by the linear project components.

D.2.5.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Reduced acreage alternative proposes construction and operation of a 125 MW facility. The 125 MW facility under this Alternative would create no additional impacts and would lower the potential to encounter fossils by virtue of a reduced construction footprint.

D.2.5.3 CEQA LEVEL OF SIGNIFICANCE

Like the proposed project, the potential is low for significant adverse impacts to the Reduced Average Alternative from geological hazards during its design life and

moderate to high paleontological resources from the construction, operation, and closure of the proposed project. It is staff's conclusion that the alternative will be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards and in a manner that both protects environmental quality and assures public safety. The CEQA level of significance would remain unchanged from the proposed project.

D.2.6 DRY COOLING ALTERNATIVE

This section identifies the potential impacts of using air-cooled condenser (ACC) systems rather than the cooling towers proposed by the applicant (NextEra) for the Genesis project. It is assumed that the ACC systems would be located where the cooling towers are currently proposed for each of the two 125 MW power block, as illustrated in **Alternatives Figure 2** (see Section B.3).

Approximately 18 ACC fans would be required for each of the two solar fields. The 18 fans, or ACC's, would operate when the ambient temperature is above 50 degrees Fahrenheit. When the temperature is below 50 degrees Fahrenheit, only 10 of the fans would be used (GSEP 2009f). The 18 ACC fans described in the GSEP cooling study would have a length of approximately 279 feet, a width of approximately 127 feet, and a height of 98 feet (GSEP 2009f). However, based on the ACC preliminary designs for nearby solar thermal projects in similar ambient temperatures, an additional 11,690 square feet could be required for siting of the fans and the fans would be up to 120 feet in height. In addition to the ACC fans, NextEra would use a small Wet Surface Air Cooler when needed to provide auxiliary cooling during extremely hot days (GSEP 2009f). This alternative is analyzed because it would reduce the amount of water required for steam turbine cooling from 822 acre-feet per year (AFY) to 66 AFY. This reduction in water use would reduce impacts to water and biological resources.

D.2.6.1 SETTING AND EXISTING CONDITIONS

This alternative is located entirely within the boundaries of the proposed project. It simply eliminates the use of wet-cooling towers and incorporated the use of air-cooled condensers (ACC) in the same location. As a result, the environmental setting would be the same as for the proposed project.

D.2.6.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Because the ACC system would be located at the same location as the proposed cooling towers within the proposed GSEP site and would not require any additional grading, impacts to geological and paleontological resources from use of the ACC system are expected to be similar as with the proposed wet-cooling system. No additional ground disturbance would be required and as such, no additional disturbance to paleontological or geological resources would be expected. As with the wet-cooling towers, the ACC system would be subject to the 2007 California Building Code and would be required to incorporate the seismic design parameters appropriate for the GSEP site. Additionally, construction of the ACC system would be required to comply with all applicable LORS as for the proposed wet-cooling system and would incorporate similar mitigation as for the proposed wet-cooling system.

No localized or regional subsidence was recorded during the 1980's and 1990's, when regional ground water extraction was at its historic maximum of approximately 48,000 AFY. Current ground water withdrawals are reportedly only approximately 2,000 AFY and the reduced proposed project demand of 66 AFY (from 822 AFY) will not approach historic pumping demands. Therefore, the potential for local or regional ground subsidence resulting from additional ground water extraction is still considered to be very low.

D.2.6.3 CEQA LEVEL OF SIGNIFICANCE

Like the proposed project, the potential is low for significant adverse impacts to the dry cooling alternative from geological hazards during its design life and to potential geological, mineralogical, and paleontological resources from the construction, operation, and closure of the proposed project. It is staff's conclusion that the alternative use of ACCs in place of cooling towers can be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards and in a manner that both protects environmental quality and assures public safety. The CEQA level of significance would remain unchanged from the proposed project.

D.2.7 NO PROJECT/NO ACTION ALTERNATIVES

D.2.7.1 NO PROJECT/NO ACTION ALTERNATIVE #1:

D.2.7.1.1 No Action on Genesis Solar Energy Project Application and on CDCA Land Use Plan Amendment

The No Project Alternative under CEQA or the No Action Alternative under NEPA defines the scenario that would exist if the proposed Genesis Solar Energy Project were not constructed. The CEQA Guidelines state that "the purpose of describing and analyzing a 'no project' alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project" (Cal. Code Rags., tit. 14 § 15126.6(l)). The No Project analysis in this SA/DEIS considers existing conditions and "what would be reasonably expected to occur in the foreseeable future if the project were not approved..." (Cal. Code Rags, tit. 14 § 15126.6(e)(2)). Under NEPA, the No Action Alternative is used as a benchmark of existing conditions by which the public and decision makers can compare the environmental effects of the proposed action and the alternatives.

If the No Project/No Action Alternative were selected, the construction and operational impacts of the Genesis project would not occur. There would be no grading of the site, no loss of resources or disturbance of approximately 4,640 acres of desert habitat, no potential impacts to paleontological resources, and no installation of power generation and transmission equipment. The No Project/No Action Alternative would also eliminate contributions to cumulative impacts on a number of resources and environmental parameters in Riverside County and in the Mojave Desert and Colorado/Sonora Desert as a whole.

In the absence of the Genesis project, however, other power plants, both renewable and non-renewable, would have to be constructed to serve the demand for electricity

and to meet RPS. If the No Project/No Action Alternative were chosen, other utility-scale solar power facilities may be built, and the impacts to the environment may be similar to those of the proposed project because these technologies require large amounts of land like that required for the Genesis project. The No Project/No Action Alternative may also lead to sitting of other non-solar renewable technologies to help achieve the California RPS.

Paleontological resources have been documented in the general area of the project. As the value of paleontological resources is predicated on their discovery within a specific geological host unit, construction of the project could result in a net gain to the science of paleontology by allowing fossils that would not otherwise have been found to be recovered, identified, studied, and preserved. The No Project/No Action Alternative would preclude this potential net gain.

D.2.7.2 NO PROJECT/NO ACTION ALTERNATIVE #2:

D.2.7.2.1 No Action on Genesis Solar Energy Project Application and Amend the CDCA Land Use Plan to Make the Area Available for Future Solar Development

Under this alternative, the proposed GSEP would not be approved by the CEC and BLM and BLM would amend the CDCA Land Use Plan of 1980, as amended, to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the project site.

Because the CDCA Plan would be amended, it is possible that the site would be developed with the same or a different solar technology. As a result, impacts related to geology, minerals, and paleontology would result from the construction and operation of the solar technology and would likely be similar to the impacts from the proposed project. Different solar technologies require different amounts of grading and maintenance; however, it is expected that all the technologies would require some grading and maintenance. As such, this No Project/No Action Alternative could result in impacts and benefits related to geology, minerals, and paleontology similar to the impacts under the proposed project.

D.2.7.3 NO PROJECT/NO ACTION ALTERNATIVE #3:

D.2.7.3.1 No Action on Genesis Solar Energy Project Application and Amend the CDCA Land Use Plan to Make the Area UNAvailable for Future Solar Development

Under this alternative, the proposed GSEP would not be approved by the CEC and BLM and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because the CDCA Plan would be amended to make the area unavailable for future solar development, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site. As a

result, the geological conditions of the site are not expected to change noticeably from existing conditions and, as such, this No Project/No Action Alternative would not result in impacts to geological features, minerals, or paleontological resources, nor would it result in the potential benefits of additional knowledge about local paleontological resources that could occur during construction of the proposed project. However, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

D.2.8 COMPARISON OF ALTERNATIVES AND PROPOSED PROJECT

**Geology and Paleontology Table 4
Comparison of Proposed Project and Alternatives**

| Impact | Proposed Project (250 MW) | Reduced Acreage Alternative (125 MW) | Dry Cooling Alternative | No Project/No Action* |
|---------------------------|--|--|--|-----------------------|
| No. of Acres | 1,800 | 900 | 1,800 | 0 |
| Geological Hazards | Ground shaking – Less than significant with mitigation | Ground shaking – Less than significant with mitigation | Ground shaking – Less than significant with mitigation | Not Applicable (N/A) |
| Geological Resources | None identified – No impact | None identified – No impact | None identified – No impact | N/A |
| Mineralogical Resources | None identified – No impact | None identified – No impact | None identified – No impact | N/A |
| Paleontological Resources | High sensitivity – No impact with mitigation | High sensitivity – No impact with mitigation | High sensitivity – No impact with mitigation | N/A |

D.2.9 CUMULATIVE IMPACTS

Section B.3, Cumulative Scenario, provides detailed information on the potential cumulative solar and other development projects in the project area. Together, these projects comprise the cumulative scenario which forms the basis of the cumulative impact analysis for the proposed project. In summary, these projects are:

- Renewable energy projects on BLM, State, and private lands, as shown on **Cumulative Figures 1 and 2** and in **Cumulative Tables 1A and 1B**. Although not all of those projects are expected to complete the environmental review processes, or be funded and constructed, the list is indicative of the large number of renewable projects currently proposed in California.

- Foreseeable future projects in the immediate project area, as shown on **Cumulative Impacts Figure 3**, Plaster City Existing and Future/Foreseeable Projects, and **Cumulative Tables 2 and 3**. Table 2 presents existing projects in this area and Table 3 presents future foreseeable projects in the project. Both tables indicate project name and project type, its location and its status.

These projects are defined within a geographic area that has been identified by the CEC and BLM as covering an area large enough to provide a reasonable basis for evaluating cumulative impacts for all resource elements or environmental parameters. Most of these projects have, are, or will be required to undergo their own independent environmental review under CEQA and/or NEPA. Even if the cumulative projects described in Section B.3 have not yet completed the required environmental processes, they were considered in the cumulative impacts analyses in this SA/Draft EIS.

D.2.9.1 GEOGRAPHIC SCOPE OF ANALYSIS

The geographic area considered for cumulative impacts on geology and paleontology is the Chuckwalla Valley in the southeastern area of the Mojave Desert geomorphic province. The potential impacts are limited to those involving paleontological resources since no geological or mineralogical resources have been identified within the boundaries of the proposed project. There are no geological hazards with potential cumulative effects, other than regional subsidence from ground water withdrawal. Significant ground water withdrawal (relative to past, discontinued withdrawal rates) is not part of the proposed project.

D.2.9.2 EFFECTS OF PAST AND PRESENT PROJECTS

Any previously completed project involving subsurface excavation without the benefit of paleontological monitoring might already have had a detrimental effect on paleontological resources in the area defined above under **Geographic Scope of Analysis**. Given the general scarcity of fossils, even within known fossil bearing strata, the possibility of prior damage is real but modest and unavoidable, after the fact.

D.2.9.3 EFFECTS OF REASONABLY FORESEEABLE FUTURE PROJECTS

D.2.9.3.1 Foreseeable Projects in the Project Area

A number of future foreseeable projects identified in **Cumulative Table 3 (Section B.3)** are located within the Chuckwalla Valley. Such projects could include ground water pumping of similar magnitude to the GSEP; however, the combined effect of these projects would still result in much less than the historic rate of 48,000 AFY, which did not cause any documented regional subsidence, such that significant impacts to regional subsidence would not be expected from the ground water pumping needed for the GSEP. Therefore, there would be no significant cumulative contribution to regional subsidence from foreseeable renewable projects in the Chuckwalla Valley.

D.2.9.3.2 Foreseeable Renewable Projects in the California Desert

As shown in **Section B.3, Cumulative Scenario Table 1A**, the El Centro office of the BLM is aware of 9 solar energy and 8 wind energy potential projects totaling 112,495

acres of land under their jurisdiction. All energy projects on BLM land would be subject to paleontological monitoring and mitigation during construction. When properly implemented and enforced, these safeguards would provide adequate protection of paleontological resources, reducing potential impacts to a (CEQA) less than significant level.

In addition to potential renewable energy projects on BLM land, a large number of renewable energy projects are proposed for the Mojave and Colorado Desert regions of Southern California on State and private lands. These projects are summarized in **Table 1B** and **Table 3 of Section B.3, Cumulative Scenario**. Of all the proposed renewable energy projects within the geographic scope of this analysis, the following, by virtue of size and location, have the greatest potential to affect paleontological resources within the geographic scope of this analysis:

- Palen Solar Power Project (5,200 acres)
- Genesis Solar Energy Project (4,460 acres)
- Desert Quartzite (7,724 acres)
- Mule Mountain Solar Project (2,684 acres)
- Big Maria Vista Solar Project (2,684 acres)
- Chuckwalla Solar 1 (4,097 acres)

These projects would be subject to CEC and/or CEQA environmental review which would include requirements for construction monitoring and mitigation of potential paleontological resources. When properly implemented and enforced, these safeguards should provide adequate protection of paleontological resources, reducing potential impacts to a (CEQA) less than significant level.

These projects would most likely include ground water pumping of similar magnitude to the GSEP; however, the combined effect of these projects would still result in much less than the historic rate of 48,000 AFY, which did not result in any documented regional subsidence, such that significant impacts to regional subsidence would not be expected. Therefore, there would be no significant cumulative contribution to regional subsidence from foreseeable renewable projects in the California Desert.

D.2.9.3.3 Contribution of the Genesis Solar Energy Project to Cumulative Impacts

Construction

The construction of the GSEP is not expected to require any significant amount of ground water pumping such that impacts to regional subsidence are not expected. Construction of the project would require localized excavation over a very large area. Because the project area lies within geological units with moderate to high paleontological sensitivity, the required excavation could, potentially, damage paleontological resources. Any damage could be cumulative to damage from other projects within the same geological formations. Implementation and enforcement of a properly designed Paleontological Resource Monitoring and Mitigation Plan (PRMMP)

at this GSEP site should result in a net gain to the science of paleontology by allowing fossils that would not otherwise have been found to be recovered, identified, studied, and preserved. Cumulative impacts from GSEP, in consideration with other nearby similar projects, should therefore be either neutral (no fossils encountered) or positive (fossils encountered, preserved, and identified).

Operation

The operation of the GSEP is expected to result in minor increased annual ground water pumping, from the current 2,000 AFY to approximately 3,600 AFY. Historic ground water withdrawals on the order of 48,000 AFY did not result in any documented subsidence in the proposed project area. Since operation of the GSEP would only contribute a minor amount of additional ground water withdrawal to the overall amount in the Chuckwalla Valley and since this cumulative amount is only a fraction of historic pumping levels that did not result in any documented subsidence, operation of the GSEP is not expected to impact regional subsidence.

The operation of the GSEP Project would not present additional risk to geological resources (none identified) or paleontological resources. Once ground disturbing activity is complete plant operation has no real potential to further affect paleontological resources. Therefore, routine plant operation would not increase potential cumulative affects on paleontological resources. The longer the plant operates, however, the more likely it is to be damaged by geological hazards, primarily earthquake-related ground shaking. Construction and operation of the plant does not increase the potential of geological hazards at the site, just their potential to damage civil improvements.

Decommissioning

The decommissioning of the GSEP is not expected to require any significant amount of ground water pumping such that impacts to regional subsidence are not expected. The decommissioning of the Genesis Solar Project is expected to result in no adverse impacts related to geology or paleontology. Any potential impact to geological resources (none identified) or paleontological resources would have occurred and been completed during the ground disturbing phase of project construction.

D.2.9.4 OVERALL CONCLUSION

Potential impacts, as they pertain to geological hazards, are essentially limited to regional subsidence due to ground water withdrawal. Historic ground water withdrawals on the order of 48,000 AFY did not result in any documented subsidence in the proposed project area. The proposed GSEP project would result in increased annual ground water pumping, from the current 2,000 AFY to approximately 3,600 AFY. However, this is still only a fraction of historic withdrawals and therefore, the proposed GSEP project would not contribute to any increase of this potential hazard. In addition, a significant number of large-scale ground water pumping operations would have to be constructed to have any measurable impact on the proposed facility.

Paleontological resources have been documented in the general area of the project. As the value of paleontological resources is associated with their discovery within a specific geological host unit, the potential impacts to paleontological resources due to

construction activities will be mitigated as required by proposed Conditions of Certification **PAL-1** through **PAL-7**. Implementation of these conditions should result in a net gain to the science of paleontology by allowing fossils that would not otherwise have been found to be recovered, identified, studied, and preserved. Cumulative impacts, in consideration with other nearby similar projects, should be either neutral (no fossils encountered) or positive (fossils encountered, preserved, and identified).

Based on the above discussion, staff believes that the potential for significant adverse cumulative impacts to the proposed project from geological hazards during the project's design life is negligible and that the potential for impacts to geological, mineralogical, and paleontological resources is very low.

The proposed conditions of certification allow the BLM Authorized Office and the Energy Commission CPM and the applicant to adopt a compliance monitoring scheme ensuring compliance with applicable LORS for geological hazards and geological, mineralogical, and paleontological resources.

D.2.10 COMPLIANCE WITH LORS

Federal, state, or local/county laws, ordinances, regulations, and standards (LORS) applicable to this project or alternatives other than the No Action alternative, were detailed in **Geology and Paleontology Table 1**. Staff anticipates that the project will be able to comply with applicable LORS.

D.2.11 NOTEWORTHY PUBLIC BENEFITS

The science of paleontology is advanced by the discovery, study and curation of new fossils. These fossils can be significant if they represent a new species, verify a known species in a new location and/or if they include structures of similar specimens that had not previously been found preserved. Most fossil discoveries are the result of excavations, either purposeful in known or suspected fossil localities or as the result of excavations made during earthwork for civil improvements or mineral extraction. Proper monitoring of excavations at the proposed GSEP facility, in accordance with an approved Paleontological Monitoring and Mitigation Plan, could result in fossil discoveries which would enhance our understanding of the prehistoric climate, geology, and geographic setting of the region for the benefit of current and future generations.

D.2.12 PROPOSED CONDITIONS OF CERTIFICATION/MITIGATION MEASURES

General conditions of certification with respect to engineering geology are proposed under Conditions of Certification **GEN-1**, **GEN-5**, and **CIVIL-1** in the **FACILITY DESIGN** section. Proposed paleontological conditions of certification follow. It is staff's opinion that the likelihood of encountering paleontological resources is moderate at the plant site.

PAL-1 The project owner shall provide BLM's Authorized Officer and the Compliance Project Manager (CPM) with the resume and qualifications of its PRS for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the Paleontological Resources Report, the project owner shall obtain BLM's Authorized Officer and CPM approval of the replacement PRS. The project owner shall keep resumes on file for qualified Paleontological Resource Monitors (PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to BLM's Authorized Officer and the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of BLM's Authorized Officer and the CPM the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by BLM's Authorized Officer and the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1. Institutional affiliations, appropriate credentials, and college degree;
2. Ability to recognize and collect fossils in the field;
3. Local geological and biostratigraphic expertise;
4. Proficiency in identifying vertebrate and invertebrate fossils; and
5. At least three years of paleontological resource mitigation and field experience in California and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. Paleontological Resource Monitors (PRMs) shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year of experience monitoring in California; or
- AS or AA in geology, paleontology, or biology and four years' experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

Verification: (1) At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

(2) At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project, stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to BLM's Authorized Officer and the CPM. The letter shall be provided to BLM's Authorized Officer and the CPM no later than one week prior to the monitor's beginning on-site duties.

(3) Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to BLM's Authorized Officer and the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS, BLM's Authorized Officer and the CPM, for approval, maps and drawings showing the footprint of the power plants, construction lay down areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS, BLM's Authorized Officer and CPM. The site grading plan and plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and be at a scale of 1 inch = 40 feet to 1 inch = 100 feet range. If the footprint of the project or its linear facilities change, the project owner shall provide maps and drawings reflecting those changes to the PRS, BLM's Authorized Officer and CPM.

If construction of the ISEGS project proceeds in phases, maps and drawings may be submitted prior to the start of each power plant. A letter identifying the proposed schedule of each project power plant shall be provided to the PRS, BLM's Authorized Officer and CPM. Before work commences on affected power plants, the project owner shall notify the PRS, BLM's Authorized Officer and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked the following week, and until ground disturbance is completed.

Verification: (1) At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings to the PRS, BLM's Authorized Officer and CPM.

(2) If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS, BLM's Authorized Officer and CPM at least 15 days prior to the start of ground disturbance.

(3) If there are changes to the scheduling of the construction phases of each power plant, the project owner shall submit a letter to BLM's Authorized Officer and the CPM within 5 days of identifying the changes.

PAL-3 If after review of the plans provided pursuant to **PAL-2**, the PRS determines that materials with moderate, high, or unknown paleontological sensitivity could be impacted, the project owner shall ensure that the PRS prepares, and the project owner submits to BLM's Authorized Officer and the CPM for review and approval, a paleontological resources monitoring and mitigation plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by BLM's Authorized Officer and the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, and sampling activities, and may be modified with BLM's Authorized Officer and CPM approval. This document shall be used as the basis of discussion when on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, BLM's Authorized Officer and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of Vertebrate Paleontology (SVP 1995) and shall include, but not be limited, to the following:

1. Assurance that the performance and sequence of project-related tasks, such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to PRMMP procedures;
2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the conditions of certification;
3. A thorough discussion of the anticipated geological units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;
4. An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;
5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling;
6. A discussion of procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;
7. A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;

8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;
9. Identification of the institution that has agreed to receive data and fossil materials collected, requirements or specifications for materials delivered for curation, and how they will be met, and the name and phone number of the contact person at the institution; and
10. A copy of the paleontological conditions of certification.

Verification: At least 30 days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to BLM's Authorized Officer and the CPM. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the PRMMP by the project owner evidenced by a signature.

PAL-4 If after review of the plans provided pursuant to **PAL-2**, the PRS determines that materials with moderate, high, or unknown paleontological sensitivity could be impacted then, prior to ground disturbance and for the duration of construction activities involving ground disturbance, the project owner and the PRS shall prepare and conduct weekly BLM Authorized Officer- and CPM-approved training for the following workers: project managers, construction supervisors, foremen and general workers involved with or who operate ground-disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving BLM Authorized Officer- and CPM-approved worker training. Worker training shall consist of an initial in-person PRS training during the project kick-off, for those mentioned above. Following initial training, a CPM-approved video or in-person training may be used for new employees. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or other areas of interest or concern. No ground disturbance shall occur prior to BLM's Authorized Officer and CPM approval of the Worker Environmental Awareness Program (WEAP), unless specifically approved by the CPM.

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect those resources.

The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Good quality photographs or physical examples of vertebrate fossils for project sites containing units of high paleontological sensitivity;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;

4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. A WEAP certification of completion form signed by each worker indicating that he/she has received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: (1) At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP, including the brochure, with the set of reporting procedures for workers to follow.

(2) At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to BLM's Authorized Officer and the CPM for approval if the project owner is planning to use a video for interim training.

(3) If the owner requests an alternate paleontological trainer, the resume and qualifications of the trainer shall be submitted to BLM's Authorized Officer and the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct training prior to BLM's Authorized Officer and CPM authorization.

(4) In the monthly compliance report (MCR, the project owner shall provide copies of the WEAP certification of completion forms with the names of those trained and the trainer or type of training (in-person or video) offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full-time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the project owner shall notify and seek the concurrence of BLM's Authorized Officer and the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring from the accepted schedule in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to BLM's Authorized Officer and the CPM prior to the change in monitoring and will be included in the monthly compliance report. The letter or email shall include the justification for the change in monitoring and be

submitted to BLM's Authorized Officer and the CPM for review and approval.

2. The project owner shall ensure that the PRM(s) keep a daily monitoring log of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with BLM's Authorized Officer and the CPM at any time.
3. The project owner shall ensure that the PRS notifies BLM's Authorized Officer and the CPM within 24 hours of the occurrence of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.
4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify BLM's Authorized Officer and the CPM within 24 hours, or Monday morning in the case of a weekend event where construction has been halted because of a paleontological find.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities placed in the monthly compliance reports. The summary will include the name(s) of PRS or PRM(s) active during the month, general descriptions of training and monitored construction activities, and general locations of excavations, grading, and other activities. A section of the report shall include the geological units or subunits encountered, descriptions of samplings within each unit, and a list of identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontological resource monitoring, including any incidents of non-compliance or any changes to the monitoring plan that have been approved by BLM's Authorized Officer and the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, BLM's Authorized Officer and the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

PAL-6 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during project construction.

Verification: The project owner shall maintain in his/her compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after

project completion and approval of BLM Authorized Officer- and CPM-approved paleontological resource report (see **PAL-7**). The project owner shall be responsible for paying any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to BLM's Authorized Officer and the CPM.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information, and submit it to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated below the level of significance.

Verification: Within 90 days after completion of ground-disturbing activities, including landscaping, the project owner shall submit the PRR under confidential cover to BLM's Authorized Officer and the CPM.

D.2.13 CONCLUSIONS

The applicant should easily be able to comply with applicable LORS, provided that the proposed conditions of certification are implemented and followed. The design and construction of the project should have no adverse impact with respect to geological, mineralogical, and paleontological resources. Staff proposes to ensure compliance with applicable LORS through the adoption of the proposed conditions of certification listed above.

Certification of Completion **Worker Environmental Awareness Program** **Genesis Solar Energy Project (09-AFC-8)**

This is to certify these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on cultural, paleontological, and biological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

| No. | Employee Name | Title/Company | Signature |
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Cultural Trainer: _____ Signature: _____ Date: ____/____/____

PaleoTrainer: _____ Signature: _____ Date: ____/____/____

Biological Trainer: _____ Signature: _____ Date: ____/____/____

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D.3 – POWER PLANT EFFICIENCY

Testimony of Shahab Khoshmashrab

D.3.1 Summary of Conclusions

The Genesis Solar Energy Project (GSEP), if constructed and operated as proposed, would generate 250 megawatts (MW) (nominal net output) of electricity. GSEP would be a solar thermal power plant employing parabolic trough technology and would occupy approximately 1,800 acres (plant facilities and solar field) in Riverside County, California. The project would consist of two independent concentrated solar electric generating plants with a nominal net electrical output of 125 MW each. The plants would use natural gas-fueled auxiliary boilers to reduce startup time and provide heat transfer fluid freeze protection. GSEP would use solar energy to generate most all of its capacity; fossil fuel (natural gas) would be used for power production during startup only.

The project would decrease reliance on fossil fuel, and would increase reliance on renewable energy resources. It would not create significant adverse effects on fossil fuel energy supplies or resources, would not require additional sources of energy supply, and would not consume significant quantities of fossil fuel energy (compared to a fossil fuel power plant of equal electrical output) in a wasteful or inefficient manner. No efficiency standards apply to this project. U.S. Bureau of Land Management (BLM) and Energy Commission staff (hereafter jointly referred to as staff) therefore concludes that this project would present no significant adverse impacts on fossil fuel energy resources.

GSEP, if constructed and operated as proposed, would occupy nearly seven acres per MW of power output, a figure roughly 30 percent higher than some other solar power technologies and roughly 20 percent lower than, yet, some other solar power technologies (see **Efficiency Table 1**).

D.3.2 Introduction

Fossil Fuel Use Efficiency

One of the responsibilities of the California Energy Commission (Energy Commission) is to make findings on whether the energy use by a power plant, including the proposed GSEP, would result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that GSEP's energy consumption creates a significant adverse impact, it must further determine if feasible mitigation measures could eliminate or minimize that impact. In this analysis, staff addresses the inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- examine whether the facility would likely present any adverse impacts upon energy resources;

- examine whether these adverse impacts are significant; and if so,
- examine whether feasible mitigation measures or alternatives could eliminate those adverse impacts or reduce them to a level of insignificance.

Solar Land Use Efficiency

Solar thermal power plants typically consume much less fossil fuel (usually in the form of natural gas) than other types of thermal power plants. Therefore, common measures of power plant efficiency such as those described above are less meaningful. So far as Energy Commission staff can determine, methods for determining the efficiency of a solar power plant have yet to be standardized; research has uncovered no meaningful attempt to quantify efficiency. The solar power industry appears to have begun discussing the issue, and, a consensus is forthcoming (CEC 2008a). In the absence of accepted standards, staff proposes the following approach.

Solar thermal power plants convert the sun's energy into electricity in three basic steps:

- Mirrors and/or collectors capture the sun's rays.
- This solar energy is converted into heat.
- This heat is converted into electricity, typically in a heat engine such as a steam turbine generator or a Stirling Engine-powered generator.

The effectiveness of each of these steps depends on the specific technology employed; the product of these three steps determines the power plant's overall solar efficiency. The greater the project's solar efficiency, the less land the plant must occupy to produce a given power output.

The most significant environmental impacts caused by solar power plants result from occupying large expanses of land. The extent of these impacts is likely in direct proportion to the number of acres affected. For this reason, staff will evaluate the land use efficiency of proposed solar power plant projects. This efficiency will be expressed in terms of power produced, or MW per acre, and in terms of energy produced, or MW-hours per acre-year. Specifically:

- Power-based solar land use efficiency is calculated by dividing the maximum net power output in MW by the total number of acres impacted by the power plant, including roads and electrical switchyards and substations.
- Energy-based solar land use efficiency is calculated by dividing the annual net electrical energy production in MW-hours per year by the total number of acres impacted by the power plant. Since different solar technologies consume differing quantities of natural gas for morning warm-up, cloudy weather output leveling and heat transfer fluid freeze protection (and some consume no gas at all), this effect will be accounted for. Specifically, gas consumption will be calculated out by reducing the plant's net energy output by the amount of energy that could have been produced by consuming the project's annual gas consumption in a modern

combined cycle power plant. This reduced energy output will then be divided by acres impacted.

D.3.3 Methodology and Thresholds for Determining Environmental Consequences

The project would consist of arrays of parabolic mirrors, solar steam generator heat exchangers, two steam turbine generators, and two wet cooling towers (GSEP 2009a, AFC §3.4.2).

The project's power cycle would be based on a steam cycle (also known as the Rankine cycle) (GSEP 2009a, AFC §3.4). The solar steam generator heat exchangers would receive heated heat transfer fluid from the solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun. The heated heat transfer fluid would be used to generate steam in the heat exchangers. This steam would then expand through the steam turbine generators to produce electrical power.

The project would utilize two auxiliary boilers fueled by natural gas to reduce startup time and to keep the temperature of the heat transfer fluid above its relatively high freezing point (54 degrees Fahrenheit [°F]). Except during startup, the project would not use fossil fuel to generate electricity.

There are currently no legal or industry standards for measuring the efficiency of solar thermal power plants (CEC 2008a).

Adverse Effects On Energy Supplies and Resources

The applicant has described its sources of natural gas for the project (GSEP 2009a AFC §3.4.6). Natural gas would be delivered to the project site via a new six-mile long, eight-inch diameter pipeline connected to an existing Southern California Edison (SCE) pipeline connection located north of Interstate 10. SCE's natural gas supply system is currently plentiful and California's access to natural gas resources from the Rocky Mountains, Canada and the southwest represent considerable energy resources in California. Therefore, it appears highly unlikely that the project would create a substantial increase in fossil fuel demand.

Additional Energy Supply Requirements

Since supplying the project with natural gas would consume such an insignificant amount of energy, there is no likelihood that additional energy supplies would be required.

Compliance With Energy Standards

No standards apply to the efficiency of this project or other non-cogeneration projects.

Alternatives To Reduce Wasteful, Inefficient, and Unnecessary Energy Consumption

Staff evaluates the project alternatives to determine if alternatives exist that could reduce the project's fuel use. The evaluation of alternatives to the project (that could reduce wasteful, inefficient, or unnecessary energy consumption) requires the examination of the project's energy consumption. The project's fuel consumption would be negligible, therefore staff need not evaluate alternatives that could reduce or eliminate the use of natural gas.

Efficiency of Alternatives to the Project

The project's objectives include the generation of electricity using the concentrated parabolic trough solar thermal technology (GSEP 2009a, AFC §2.1).

Alternative Generating Technologies

Alternative generating technologies for GSEP are considered in the AFC (GSEP 2009a, AFC §3.10.8). For purposes of this analysis, natural gas, oil, coal, nuclear, geothermal, biomass, hydroelectric, wind and other solar technologies are all considered. Given the project objectives, location, air pollution control requirements, and the commercial availability of the above technologies, staff agrees with the applicant that the selected solar thermal technology is a reasonable selection.

Staff, therefore, believes that GSEP would not constitute a significant adverse impact on fossil fuel energy resources compared to feasible alternatives.

D.3.4 Proposed Project

D.3.4.1 SETTING AND EXISTING CONDITIONS

The project would consist of arrays of parabolic mirrors, solar steam generator heat exchangers, two steam turbine generators, and two wet cooling towers (GSEP 2009a, AFC §3.4.2).

The project's power cycle would be based on a steam cycle (also known as the Rankine cycle) (GSEP 2009a, AFC §3.4). The solar steam generator heat exchangers would receive heated heat transfer fluid from the solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun. The heated heat transfer fluid would be used to generate steam in the heat exchangers. This steam would then expand through the steam turbine generators to produce electrical power.

The project would utilize two auxiliary boilers fueled by natural gas to reduce startup time and to keep the temperature of the heat transfer fluid above its relatively high freezing point (54 degrees Fahrenheit [°F]). Except during startup, the project would not use fossil fuel to generate electricity.

D.3.4.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Project Energy Requirements and Energy Use Efficiency

The project would consist of arrays of parabolic mirrors, solar steam generator heat exchangers, two steam turbine generators, and two wet cooling towers (GSEP 2009a, AFC §3.4.2).

The project's power cycle would be based on a steam cycle (also known as the Rankine cycle) (GSEP 2009a, AFC §3.4). The solar steam generator heat exchangers would receive heated heat transfer fluid from the solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun. The heated heat transfer fluid would be used to generate steam in the heat exchangers. This steam would then expand through the steam turbine generators to produce electrical power.

The project would utilize two auxiliary boilers fueled by natural gas to reduce startup time and to keep the temperature of the heat transfer fluid above its relatively high freezing point (54 degrees Fahrenheit [°F]). Except during startup, the project would not use fossil fuel to generate electricity.

Due to the project's negligible consumption of natural gas, staff considers the impact of the project's fuel consumption on energy supplies and energy efficiency to be less than significant.

Adverse Effects on Energy Supplies and Resources

The applicant has described its sources of natural gas for the project (GSEP 2009a AFC §3.4.6). Natural gas would be delivered to the project site via a new six-mile long, eight-inch diameter pipeline connected to an existing SCE pipeline connection located north of Interstate 10. SCE's natural gas supply system is currently plentiful and California's access to natural gas resources from the Rocky Mountains, Canada and the southwest represent considerable energy resources in California. Therefore, it appears highly unlikely that the project would create a substantial increase in fossil fuel demand.

Additional Energy Supply Requirements

Since supplying the project with natural gas would consume such an insignificant amount of energy, there is no likelihood that additional energy supplies would be required.

Compliance with Energy Standards

No standards apply to the efficiency of this project or other non-cogeneration projects.

Alternatives to Reduce Wasteful, Inefficient, and Unnecessary Energy Consumption

Staff evaluates the project alternatives to determine if alternatives exist that could reduce the project's fuel use. The evaluation of alternatives to the project (that could

reduce wasteful, inefficient, or unnecessary energy consumption) requires the examination of the project's energy consumption. The project's fuel consumption would be negligible, therefore staff is not evaluating alternatives that could reduce or eliminate the use of natural gas.

Alternative Generating Technologies

Alternative generating technologies for GSEP are considered in the AFC (GSEP 2009a, AFC §3.10.8). For purposes of this analysis, natural gas, oil, coal, nuclear, geothermal, biomass, hydroelectric, wind and other solar technologies are all considered. Given the project objectives, location, air pollution control requirements, and the commercial availability of the above technologies, staff agrees with the applicant that the selected solar thermal technology is a reasonable selection.

Staff, therefore, believes that the GSEP Project would not constitute a significant adverse impact on fossil fuel energy resources compared to feasible alternatives.

Method and Threshold for Determining the Significance of Solar Land Use Energy Resources

The solar insolation falling on the earth's surface can be regarded as an energy resource. Since this energy is inexhaustible, its consumption does not present the concerns inherent in fossil fuel consumption. What is of concern, however, is the extent of land area required to capture this solar energy and convert it to electricity. Setting aside hundreds or thousands of acres of land for solar power generation removes it from alternative uses. Constructing buildings and solar collector foundations can disturb environmental resources.

Staff tabulates the land use efficiency of the project (described above) and compares it to similar measures for other solar power plant projects that have passed through, or are passing through the Energy Commission's licensing process.

As this is written, several solar power plant projects have progressed significantly through the Energy Commission siting process. Several of these projects' power and energy output, and the extent of the land occupied by them, are summarized in **Efficiency Table 1**, below. The solar land use efficiency for a typical natural gas-fired combined cycle power plant is shown only for comparison.

Adverse Effects on Land Use

A solar power project that occupies more land than another project holds the potential to produce more land use-related environmental impacts.

Project Land Use

GSEP would produce power at the rate of 250 MW net, and would generate energy at the rate of 600,000 MW-hours net per year, while occupying 1,800 acres (GSEP 2009a, AFC §§3.4.1, 3.4.2, 3.10). Staff calculates power-based land use efficiency thus:

Power-based efficiency: $250 \text{ MW} \div 1,800 \text{ acres} = 0.14 \text{ MW/acre}$ or **7.2 acres/MW**

Staff calculates energy-based land use efficiency thus:

$$600,000 \text{ MWh/year} \div 1,800 \text{ acres} = \mathbf{333 \text{ MWh/acre-year}}$$

As seen in **Efficiency Table 1**, GSEP, employing parabolic trough technology, is more efficient in use of land than the SES Solar One and SES Solar Two projects, which would employ the Stirling Energy Systems SunCatcher technology, and the Ivanpah Solar Electric Generating System project, which would employ BrightSource's power tower technology. GSEP, if constructed and operated as proposed, would occupy nearly seven acres per MW of power output, a figure roughly 30 percent higher than some other solar power technologies and roughly 20 percent lower than, yet, some other solar power technologies (see **Efficiency Table 1**).

Alternatives to Reduce Solar Land Use Impacts

Building and operating a natural gas-fired combined cycle power plant would yield much greater land use efficiency than any solar power plant; see **Efficiency Table 1**. However, this would not achieve the basic project objective, to generate electricity from the renewable energy of the sun and would not further the state's renewable energy development and green-house gas reduction goals.

Efficiency Table 1 demonstrates that the land use efficiency figure of GSEP nearly equates the median figure for all the solar thermal technologies currently passing through the Energy Commission's licensing process.

Alternative Heat Rejection System

The applicant proposes to employ wet cooling systems (evaporative cooling towers) as the means for rejecting power cycle heat from the steam turbine (GSEP 2009a, AFC §§1.0, 3.4.1). An alternative heat rejection system would utilize an air-cooled condenser.

The local climate in the project area is characterized by high temperatures and low relative humidity (low wet-bulb temperature). In low temperatures and high relative humidity (low dry-bulb temperature), the air-cooled condenser performs slightly more efficiently than the evaporative cooling tower. In high temperatures and low relative humidity, typical of the project area, the evaporative cooling tower performs slightly more efficiently than the air-cooled condenser. However, such an improvement may be less significant compared to the adverse environmental impacts of wet cooling over dry cooling, such as those identified in the **Soil and Water Resources** section of this document.

Efficiency Table 1 — Solar Land Use Efficiency

| Project | Generating Capacity (MW net) | Footprint (Acres) | Annual Energy Production (MWh net) | Annual Fuel Consumption (MMBtu LHV) | Land Use Efficiency (Power-Based) (MW/acre) | Land Use Efficiency (Energy – Based) (MWh/acre-year) | |
|---------------------------------------|------------------------------|-------------------|------------------------------------|-------------------------------------|---|--|---------------------------|
| | | | | | | Total | Solar Only ^{1,2} |
| Genesis Solar | 250 | 1,800 | 600,000 | 60,000 | 0.14 | 333 | 329 |
| Ridgecrest Solar | 250 | 1,440 | 500,000 | 44,818 | 0.17 | 347 | 343 |
| Beacon Solar (08-AFC-2) | 250 | 1,321 | 600,000 | 36,000 | 0.19 | 454 | 450 |
| Ivanpah SEGS (07-AFC-5) | 400 | 3,744 | 960,000 | 432,432 | 0.11 | 256 | 238 |
| SES Solar One (08-AFC-13) | 850 | 8,200 | 1,840,000 | 0 | 0.11 | 224 | 224 |
| SES Solar Two (08-AFC-5) | 750 | 6,500 | 1,620,000 | 0 | 0.12 | 249 | 249 |
| San Joaquin Solar Hybrid | 106 | 640 | 286,978 | 25,180 | 0.17 | 448 | 443 |
| | 106 | 640 | 774,000 | 5,899,500 | 0.17 | 1209 | 415 |
| Solar Millenium (Blythe) | 1000 | 5,950 | 2,100,000 | 172,272 | 0.17 | 353 | 349 |
| Solar Millenium (Palen) | 500 | 2970 | 1,000,000 | 89,636 | 0.17 | 337 | 332 |
| Mojave Solar | 250 | 1684 | 630,000 | 94,280 | 0.15 | 374 | 366 |
| Rice Solar | 150 | 1,410 | 450,000 | 0 | 0.11 | 319 | 319 |
| Avenal Energy (08-AFC-1) ³ | 600 | 25 | 3,023,388 | 24,792,786 | 24.0 | 120,936 | N/A |

¹ Similar to another Solar Millenium (Palen).

² Net energy output is reduced by natural gas-fired combined cycle proxy energy output; see **Efficiency Appendix A**.

³ Example natural gas-fired combined cycle plant.

Project Closure

GSEP is expected to have a lifespan of 30 years (GSEP 2009a, AFC §3.9.2). At any point during this time, temporary or permanent closure of the solar facility could occur. Temporary closure would be a result of necessary maintenance, hazardous weather conditions, or damage due to a natural disaster. Permanent closure would be result of damage that is beyond repair, adverse economic conditions, or other significant reasons.

Both temporary and permanent closures would require the applicant to submit to the CEC a contingency plan or a decommissioning plan, respectively. A contingency plan would be implemented to ensure compliance with applicable LORS, and appropriate shutdown procedures depending on the length of the cessation. A decommissioning plan would be implemented to ensure compliance with applicable LORS, removal of equipment and shutdown procedures, site restoration, potential decommissioning alternatives, and the costs and source of funds associated with decommissioning activities.

D.3.4.3 CEQA LEVEL OF SIGNIFICANCE

CEQA guidelines state that the environmental analysis "...shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Title 14 CCR §15126.4[a][1]). Appendix F of the guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce the wasteful, inefficient, and unnecessary consumption of energy (Title 14, CCR §15000 et seq., Appendix F).

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient, and unnecessary consumption of fuel or energy.

D.3.5 REDUCED ACREAGE ALTERNATIVE

The Reduced Acreage Alternative would essentially be Unit 1 of the proposed project, including a 125 MW solar facility located within the boundaries of the proposed project as defined by NextEra. This alternative is analyzed for two major reasons: (1) it eliminates about 50% percent of the proposed project area so all impacts are reduced, and (2) by retaining the eastern solar field, which is located on flowing desert washes, it would reduce impacts to the sand dune and playa areas and to the Mojave Fringe-toed

Lizard habitat. The alternative would also reduce impacts to wildlife movement by reducing obstruction of the Palen wash and would maintain, thru both fluvial and Aeolian processes, the dune and sandy habitats. The boundaries of the Reduced Acreage Alternative are shown in **Alternatives Figure 1**.

D.3.5.1 Setting and Existing Conditions

This alternative is located entirely within the boundaries of the proposed project. It simply eliminates effects to the eastern 125 MW solar field and relocates the gas yard approximately 1.75 miles northwest of its present location. As a result, the environmental setting consists of the western portion of the proposed project, as well as the area affected by the linear project components.

D.3.5.2 Assessment of Impacts and Discussion of Mitigation

Since the Reduced Acreage plant output would produce only 125 MW (50 percent of the proposed project), its impacts on the San Diego Gas & Electric grid would be proportionately less. Since the Reduced Acreage plant would produce 125 MW while occupying approximately 50 percent of the land needed for the proposed project, its power-based land use efficiency would be about the same as the proposed project.

D.3.5.3 CEQA Level of Significance

If the Reduced Acreage alternative were constructed, the CEQA Level of Significance, as measured by land use efficiency, would amount to approximately the same levels described for the proposed project.

D.3.6 DRY COOLING ALTERNATIVE

This section identifies the potential impacts of using air-cooled condenser (ACC) systems rather than the cooling towers proposed by NextEra for the Genesis project. It is assumed that the ACC systems would be located where the cooling towers are currently proposed for each of the two 125 MW power blocks, as illustrated in **Alternatives Figure 2** (see Section B.3).

According to the applicant, approximately 18 ACC fans would be required for each of the two solar fields. The 18 fans would operate when the ambient temperature is above 50 degrees Fahrenheit (GSEP 2009f). When the temperature is below 50 degrees Fahrenheit, only 10 of the fans would be used (GSEP 2009f). The 18 fans described in the GSEP cooling study would have a length of approximately 279 feet, a width of approximately 127 feet, and a height of 98 feet (GSEP 2009f). However, based on the ACC preliminary designs for nearby solar thermal projects in similar ambient temperatures, an additional 11,690 square feet could be required for siting of the fans and the fans would be up to 120 feet in height. In addition to the ACC fans, NextEra would use a small Wet Surface Air Cooler when needed to provide auxiliary cooling during extremely hot days (GSEP 2009f). This alternative is analyzed because it would reduce the amount of water required for steam turbine cooling from 822 acre-feet per year (AFY) to 66 AFY. This reduction in water use would reduce impacts to water and biological resources.

D.3.6.1 Setting and Existing Conditions

This alternative is located entirely within the boundaries of the proposed project. It simply eliminates the use of wet-cooling towers and incorporates the use of air-cooled condensers (ACC) in the same location. As a result, the environmental setting would be the same as for the proposed project.

D.3.6.2 Assessment of Impacts and Discussion of Mitigation

The local climate in the project area is characterized by high temperatures and low relative humidity (low wet-bulb temperature). In low temperatures and high relative humidity (low dry-bulb temperature), the air-cooled condenser performs slightly more efficiently than the evaporative cooling tower. In high temperatures and low relative humidity, typical of the project area, the evaporative cooling tower performs slightly more efficiently than the air-cooled condenser. However, such an improvement may be less significant compared to the adverse environmental impacts of wet cooling over dry cooling, such as those identified in the **Soil and Water Resources** section of this document.

D.3.6.3 CEQA Level of Significance

In weather conditions typical of the project area the evaporative cooling tower performs slightly more efficiently than the air-cooled condenser. However, such an improvement may be less significant compared to the adverse environmental impacts of wet cooling over dry cooling, such as those identified in the **Soil and Water Resources** section of this document.

D.3.7 NO PROJECT / NO ACTION ALTERNATIVE

The No Project Alternative under CEQA or the No Action Alternative under NEPA defines the scenario that would exist if the proposed Genesis Project were not constructed. The CEQA Guidelines state that “the purpose of describing and analyzing a ‘no project’ alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project” (Cal. Code Regs., tit. 14 § 15126.6(i)). The No Project analysis in this SA/DEIS considers existing conditions and “what would be reasonably expected to occur in the foreseeable future if the project were not approved...” (Cal. Code Regs, tit. 14 § 15126.6(e)(2)). Under NEPA, the No Action Alternative is used as a benchmark of existing conditions by which the public and decision makers can compare the environmental effects of the proposed action and the alternatives.

If the No Project/No Action Alternative were selected, the construction and operational impacts of the GSEP would not occur. There would be no grading of the site, no loss of resources or disturbance of approximately 1,800 acres of desert habitat, no impacts to cultural resources, and no installation of power generation and transmission equipment. The No Project/No Action Alternative would also eliminate contributions to cumulative impacts on a number of resources and environmental parameters in Riverside County and in the Colorado Desert as a whole.

In the absence of the Genesis Project, however, other power plants, both renewable and non-renewable, would have to be constructed to serve the demand for electricity and to meet RPS. If the No Project/No Action Alternative were chosen, other utility-scale solar power facilities may be built, and the impacts to the environment may be similar to those of the proposed project because these technologies require large amounts of land like that required for the GSEP. The No Project/No Action Alternative may also lead to licensing of other non-solar renewable technologies to help achieve the California RPS.

Additionally, if the No Project/No Action Alternative were chosen, it is likely that additional gas-fired power plants would be built or that existing gas-fired plants could operate longer. If the proposed project were not built, California would not benefit from the reduction in greenhouse gases that this facility would provide, and PG&E would not receive the 250 MW contribution to its renewable state-mandated energy portfolio. If a fossil-fueled power plant is built in place of GSEP, adverse impacts on energy resources and supply would occur. However, the extent of those impacts would have to be analyzed at the time of project licensing.

D.3.8 CUMULATIVE IMPACT ANALYSIS

Geographic Extent

The geographic scope for considering cumulative impacts on electric system efficiency for this project is the SCE grid.

Existing Cumulative Conditions

The SCE grid includes many natural gas-fired power plants and a growing number of solar and wind power plants. The ratio of gas-fired to renewable energy power plants is currently high. GSEP, when combined with the other power plants in the SCE grid system would create no cumulative impacts on power plant efficiency.

Future Foreseeable Projects

Future projects on the SCE grid will likely include numerous solar and wind power plants, as well as more natural gas-fired peaking plants. The ratio of gas-fired to renewable energy power plants is likely to drop as SCE acquires more solar and wind power energy in response to government mandates to increase the portion of energy produced from renewable sources.

Foreseeable Projects in the Project Area

No new power plant projects, gas-fired or renewable, are projected in the project area.

Foreseeable Renewable Projects in the California and Arizona Desert

Numerous solar, wind power and geothermal projects are foreseeable in the deserts of California and Arizona. However, the efficiency of GSEP will neither affect, nor be affected by, the efficiency of these projects. Each project's efficiency affects only that project, and could not produce a cumulative effect that could involve other projects.

D.3.9 Compliance with LORS

No federal, state, or local/county laws, ordinances, regulations, and standards (LORS) apply to the efficiency of this project.

D.3.10 Noteworthy Public Benefits

The GSEP project would employ an advanced solar thermal technology. Solar energy is renewable and unlimited. The project would have a less than significant adverse impact on nonrenewable energy resources (natural gas). Consequently, the project would help in reducing California's dependence on fossil fuel-fired power plants.

D.3.11 Proposed Conditions of Certification/Mitigation Measures

No conditions of certification are proposed.

D.3.12 Conclusions

Fossil fuel energy use

GSEP, if constructed and operated as proposed, would use solar energy to generate most of its capacity, consuming insignificant amounts of natural gas for power production only during startup. The project would decrease reliance on fossil fuel, and would increase reliance on renewable energy resources. It would not create significant adverse effects on energy supplies or resources, would not require additional sources of energy supply, and would not consume energy in a wasteful or inefficient manner. No energy standards apply to this project. Staff therefore concludes that this project would present no significant adverse impacts on energy resources. No cumulative impacts on energy resources are likely. Facility closure would not likely present significant impacts on electric system efficiency.

Land use

GSEP, if constructed and operated as proposed, would occupy nearly seven acres per MW of power output, a figure roughly 30 percent higher than some other solar power technologies and roughly 20 percent lower than, yet, some other solar power technologies (see **Efficiency Table 1**).

D.3.13 References

CEC 2008a – Report of Conversation between Steve Baker and Golam Kibrya – CEC staff. February 22, 2008.

GSEP 2009a – Genesis Solar Energy Project/T. Bernhardt (tn:53083) Application for Certification for the Genesis Solar Energy Project. 08/31/2009

D.4 - POWER PLANT RELIABILITY

Testimony of Shahab Khoshmashrab

D.4.1 SUMMARY OF CONCLUSIONS

The applicant predicts an equivalent availability factor of 96-98 percent, which staff believes is achievable. (The availability factor of a power plant is the percentage of time it is available to generate power; both planned and unplanned outages subtract from this availability.) Based on a review of the proposal, staff concludes that the Genesis Solar Energy Project (GSEP) would be built and would operate in a manner consistent with industry norms for reliable operation. No conditions of certification are proposed.

D.4.2 INTRODUCTION

In this analysis, California Energy Commission (Energy Commission) staff addresses the reliability issues of the GSEP project to determine if the power plant is likely to be built in accordance with typical industry norms for reliable power generation. Staff uses this norm as a benchmark because it ensures that the resulting project would not be likely to degrade the overall reliability of the electric system it serves (see the “Setting” subsection, below).

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliable power generation. While the applicant has predicted an equivalent availability factor of 96-98 percent for the GSEP (see below), staff uses typical industry norms as the benchmark, rather than the applicant’s projection, to evaluate the project’s reliability.

D.4.3 METHODOLOGY AND THRESHOLDS FOR DETERMINING ENVIRONMENTAL CONSEQUENCES

METHOD FOR DETERMINING RELIABILITY

The Energy Commission must make findings as to how a project is designed, sited, and operated in order to ensure its safe and reliable operation (Title 20, CCR §1752[c]). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if a project is at least as reliable as other power plants on that system.

The availability factor of a power plant is the percentage of time it is available to generate power; both planned and unplanned outages subtract from this availability.

Measures of power plant reliability are based upon both the plant's actual ability to generate power when it is considered to be available and upon starting failures and unplanned (or forced) outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Throughout its intended 30-year life, the GSEP is expected to operate reliably (GSEP 2009a, AFC § 3.9.2). Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability requires adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for a project and compares them to industry norms. If the factors compare favorably for this project, staff will then conclude that the GSEP would be as reliable as other power plants on the electric system and would not degrade system reliability.

D.4.4 PROPOSED PROJECT

D.4.4.1 SETTING AND EXISTING CONDITIONS

In the restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the state's control area operators, such as the California Independent System Operator (California ISO), that purchase, dispatch, and sell electric power throughout the state. Determining how the California ISO and other control area operators would ensure system reliability has been an ongoing effort. Protocols have been developed and put in place that allow sufficient reliability to be maintained under the competitive market system. "Must-run" power purchase agreements and "participating generator" agreements are two mechanisms that have been employed to ensure an adequate supply of reliable power.

In September 2005, California AB 380 (Núñez, Chapter 367, Statutes of 2005) became law. This modification to the Public Utilities Code requires the California Public Utilities Commission to consult with the California ISO to establish resource adequacy requirements for all load-serving entities (basically, publicly and privately owned utility companies). These requirements include maintaining a minimum reserve margin (extra generating capacity to serve in times of equipment failure or unexpected demand) and maintaining sufficient local generating resources to satisfy the load-serving entity's peak demand and operating reserve requirements.

In order to fulfill this mandate, the California ISO has begun to establish specific criteria for each load-serving entity under its jurisdiction. These criteria guide each load-serving entity in deciding how much generating capacity and ancillary services to build or purchase, after which the load-serving entity issues power purchase agreements to satisfy these needs.

The California ISO's mechanisms to ensure adequate power plant reliability apparently were devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there has been valid cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital

outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants were to exhibit individual reliability sufficiently lower than this historical level, the assumptions used by California ISO to ensure system reliability would prove invalid, with potentially disappointing results. Accordingly, staff has recommended that power plant owners continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

As part of its plan to provide needed reliability, the applicant proposes to operate the 250-megawatt (MW) (net power output) GSEP, a solar thermal power plant facility employing advanced solar power technology. This project, using renewable solar energy, would provide dependable power to the grid, generally during the hours of peak power consumption by the interconnecting utility(s). This project would help serve the need for renewable energy in California, as all its generated electricity would be produced by a reliable source of energy that is available during the hot summer afternoons, when power is needed most.

The project is expected to achieve an equivalent availability factor in the range of 96-98 percent. The project is anticipated to operate at an annual capacity factor of approximately 27 percent (GSEP 2009a, AFC § 3.4.2).

D.4.4.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

EQUIPMENT AVAILABILITY

Equipment availability would be ensured by adoption of appropriate quality assurance/quality control (QA/QC) programs during the design, procurement, construction, and operation of the plant and by providing for the adequate maintenance and repair of the equipment and systems discussed below.

Quality Control Program

The applicant describes a QA/QC program (GSEP 2009a, AFC § 3.4) that is typical of the power industry. Equipment would be purchased from qualified suppliers based on technical and commercial evaluations. Suppliers' personnel, production capability, past performance, QA programs, and quality history would be evaluated. The project owner would perform receipt inspections, test components, and administer independent testing contracts. Staff expects that implementation of this program would result in standard reliability of design and construction. To ensure this implementation, staff has proposed appropriate conditions of certification in the section of this document entitled **Facility Design**.

PLANT MAINTAINABILITY

Equipment Redundancy

The project, as proposed in the AFC, would be able to operate only when the sun is shining. Maintenance or repairs could be done when the plant is shut down at night. This would help to enhance the project's reliability. Also, the applicant proposes to provide redundant pieces of equipment for those that are most likely to require service

or repair (GSEP 2009a, AFC §§ 3.4.3, 3.4.4, 3.11.6). This redundancy would allow service or repair to be done during sunny days when the plant is in operation, if required.

Major plant systems are designed with adequate redundancy to ensure their continued operation if equipment fails.

Maintenance Program

Equipment manufacturers provide maintenance recommendations for their products, and the applicant would base the project's maintenance program on those recommendations (GSEP 2009a, AFC §§ 3.4, 3.11). The program would encompass both preventive and predictive maintenance techniques. Maintenance outages would probably be planned for periods of low electricity demand. Staff expects that the project would be adequately maintained to ensure an acceptable level of reliability.

FUEL AND WATER AVAILABILITY

The long-term availability of fuel and of water for cooling or process use is necessary to ensure the reliability of any power plant. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant could be curtailed, threatening both the power supply and the economic viability of the plant.

Fuel Availability

The GSEP would consume insignificant amounts of natural gas for power generation. The sole consumption of natural gas would be to reduce startup time and to keep the temperature of the heat transfer fluid above its freezing point.

Natural gas would be delivered to the GSEP site by a six-mile-long, eight-inch-diameter natural gas pipeline that will be connected to an existing Southern California Edison (SCE) pipeline (GSEP 2009a, AFC § 3.4.6). The SCE natural gas supply system draws from extensive supplies originating in the Rocky Mountains, in the southwest, and in Canada, and is capable of delivering the required amount of gas to this project. Staff believes that there will be adequate fuel supply to meet the project's needs.

Water Supply Reliability

The GSEP has proposed to use groundwater water from on-site wells for domestic and industrial water needs, including steam cycle makeup, mirror washing, service water and fire protection water. This source of water supply appears to be sufficient for the project (see **Soil and Water Resources** section of this document). Therefore, staff concludes that this source of water supply is a reliable source of water for the project.

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. Tsunamis (tidal waves) and seiches (waves in inland bodies of water) are not likely to present hazards for this project, but seismic shaking (earthquakes) and flooding could present credible threats to the project's reliable operation (GSEP 2009a, AFC §§1.2, 2.5.6.6).

Seismic Shaking

The project will be designed and constructed to the latest applicable LORS (please see the section of this document entitled **Facility Design**). Compliance with current seismic design LORS represents an upgrading of performance during seismic shaking compared to older facilities since these LORS have been continually upgraded. Because it would be built to the latest seismic design LORS, this project would likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see the section of this document entitled **Facility Design**. In light of the general historical performance of California power plants and the electrical system in seismic events, staff has no special concerns with the power plant's functional reliability during earthquakes. Please also see the "Faulting and Seismicity" portion of the **Geology and Paleontology** section of this document

Flooding

The project site is relatively flat and generally slopes from north to south with elevations of approximately 400 to 370 feet above mean sea level. The Federal Emergency Management Agency has not mapped the site for the presence of floodplains, but for the vast majority of the time, the area is dry and devoid of any surface flow anywhere in the project area (GSEP 2009a, AFC §§ 3.3, 4.1.1.1). With proper plant design (ensured by adherence to the proposed **Facility Design** conditions of certification), staff believes there should be no significant concerns with power plant functional reliability due to flooding. For further discussion, see **Soil and Water Resources** and **Geology and Paleontology**.

COMPARISON WITH EXISTING FACILITIES

The North American Electric Reliability Corporation (NERC) maintains industry statistics for availability factors (as well as other related reliability data). The NERC regularly polls North American utility companies on their project reliability through its Generating Availability Data System and periodically summarizes and publishes those statistics on the Internet at <<http://www.nerc.com>>. Because no statistics are available for solar power plants, staff compares the project's availability factor to the average availability factor of fossil fuel-fired units. Also because the project's total net power output would be 250 MW, staff uses the NERC statistics for 200–299 MW units. The NERC reported an availability factor of 86.01 percent as the generating unit average for the years 2002 through 2006 for fossil fuel units of 200-299 MW (NERC 2007).

The concentrated parabolic trough solar thermal technology is not new. This technology has been employed for over 20 years at the nearby Solar Electric Generating System facilities in the Mojave Desert. Staff believes that the parabolic trough technology is likely to exhibit the projected reliability.

The project would use multi-pressure condensing steam turbine technology. Steam turbines incorporating this technology have been on the market for many years now and are expected to exhibit typically high availability. Also, because solar-generated steam is cleaner than burnt fossil fuel, the GSEP steam cycle units would likely require less frequent maintenance than units that burn fossil fuel. Therefore, the applicant's

expectation of an annual availability factor of 96-98 percent (GSEP 2009a, AFC § 3.4.2) appears reasonable when compared with the NERC figures throughout North America (see above). In fact, these machines might well be expected to outperform the fleet of various turbines (mostly older and smaller) that make up NERC statistics. Additionally, the project, as proposed, would be able to operate only when the sun is shining. Maintenance or repairs could be done when the plant is shut down at night.

The applicant's estimate of plant availability, therefore, appears to be realistic. Stated procedures for assuring the design, procurement, and construction of a reliable power plant appear to be consistent with industry norms, and staff believes they are likely to ultimately produce an adequately reliable plant.

D.4.4.3 CEQA LEVEL OF SIGNIFICANCE

A discussion of the CEQA level of significance is not necessary because the CEQA guidelines do not apply to power plant reliability.

D.4.5 REDUCED ACREAGE ALTERNATIVE

The Reduced Acreage Alternative would essentially be Unit 1 of the proposed project, a 125 MW solar facility located within the boundaries of the proposed project as defined by NextEra. This alternative is analyzed for two major reasons: (1) it eliminates about 50% percent of the proposed project area so all environmental impacts are reduced, and (2) by retaining the eastern solar field, which is located on flowing desert washes, it would reduce impacts to the sand dune and playa areas and to the Mojave Fringe-toed Lizard habitat. The alternative would also reduce impacts to wildlife movement by reducing obstruction of the Palen wash and would maintain, thru both fluvial and Aeolian processes, the dune and sandy habitats. The boundaries of the Reduced Acreage Alternative are shown in **Alternatives Figure 1**.

D.4.5.1 Setting and Existing Conditions

This alternative is located entirely within the boundaries of the proposed project. It simply eliminates effects to the eastern 125 MW solar field and relocates the gas yard approximately 1.75 miles northwest of its present location. As a result, the environmental setting consists of the western portion of the proposed project, as well as the area affected by the linear project components.

D.4.5.2 Assessment of Impacts and Discussion of Mitigation

The impacts of this alternative on reliability would be the same as those described above for the proposed project

D.4.5.3 CEQA Level of Significance

A discussion of the CEQA level of significance is not necessary because the CEQA guidelines do not apply to power plant reliability.

D.4.6 DRY COOLING ALTERNATIVE

This section identifies the potential impacts of using air-cooled condenser (ACC) systems rather than the cooling towers proposed by NextEra for the Genesis project. It

is assumed that the ACC systems would be located where the cooling towers are currently proposed for each of the two 125 MW power blocks, as illustrated in **Alternatives Figure 2** (see Section B.3).

According to the applicant, approximately 18 ACC fans would be required for each of the two solar fields. The 18 fans would operate when the ambient temperature is above 50 degrees Fahrenheit (GSEP 2009f). When the temperature is below 50 degrees Fahrenheit, only 10 of the fans would be used (GSEP 2009f). The 18 fans described in the GSEP cooling study would have a length of approximately 279 feet, a width of approximately 127 feet, and a height of 98 feet (GSEP 2009f). However, based on the ACC preliminary designs for nearby solar thermal projects in similar ambient temperatures, an additional 11,690 square feet could be required for siting of the fans and the fans would be up to 120 feet in height. In addition to the ACC fans, NextEra would use a small Wet Surface Air Cooler when needed to provide auxiliary cooling during extremely hot days (GSEP 2009f). This alternative is analyzed because it would reduce the amount of water required for steam turbine cooling from 822 acre-feet per year (AFY) to 66 AFY.

D.4.6.1 Setting and Existing Conditions

This alternative is located entirely within the boundaries of the proposed project. It simply eliminates the use of wet-cooling towers and incorporates the use of air-cooled condensers (ACC) in the same location. As a result, the environmental setting would be the same as for the proposed project.

D.4.6.2 Assessment of Impacts and Discussion of Mitigation

The local climate in the project area is characterized by high temperatures and low relative humidity (low wet-bulb temperature). In low temperatures and high relative humidity (low dry-bulb temperature), the air-cooled condenser performs slightly more efficiently than the evaporative cooling tower. In high temperatures and low relative humidity, typical of the project area, the evaporative cooling tower performs slightly more efficiently than the air-cooled condenser. However, such an improvement may be less significant compared to the adverse environmental impacts of wet cooling over dry cooling, such as those identified in the **Soil and Water Resources** section of this document.

D.4.7 NO PROJECT / NO ACTION ALTERNATIVE

The No Project Alternative under CEQA or the No Action Alternative under NEPA defines the scenario that would exist if the proposed Genesis Project were not constructed. The CEQA Guidelines state that “the purpose of describing and analyzing a ‘no project’ alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project” (Cal. Code Regs., tit. 14 § 15126.6(i)). The No Project analysis in this SA/EIR considers existing conditions and “what would be reasonably expected to occur in the foreseeable future if the project were not approved...” (Cal. Code Regs, tit. 14 § 15126.6(e)(2)). Under NEPA, the No Action Alternative is used as a benchmark of existing conditions

by which the public and decision makers can compare the environmental effects of the proposed action and the alternatives.

If the No Project/No Action Alternative were selected, the construction and operational impacts of the GSEP would not occur. There would be no grading of the site, no loss of resources or disturbance of approximately 1,800 acres of desert habitat, no impacts to cultural resources, and no installation of power generation and transmission equipment. The No Project/No Action Alternative would also eliminate contributions to cumulative impacts on a number of resources and environmental parameters in Riverside County and in the Colorado Desert as a whole.

In the absence of the Genesis Project, however, other power plants, both renewable and non-renewable, would have to be constructed to serve the demand for electricity and to meet RPS. If the No Project/No Action Alternative were chosen, other utility-scale solar power facilities may be built, and the impacts to the environment may be similar to those of the proposed project because these technologies require large amounts of land like that required for the GSEP. The No Project/No Action Alternative may also lead to licensing of other non-solar renewable technologies to help achieve the California RPS.

Additionally, if the No Project/No Action Alternative were chosen, it is likely that additional gas-fired power plants would be built or that existing gas-fired plants could operate longer. If the proposed project were not built, California would not benefit from the reduction in greenhouse gases that this facility would provide, and PG&E would not receive the 250 MW contribution to its renewable state-mandated energy portfolio.

D.4.8 CUMULATIVE IMPACT ANALYSIS

Geographic Extent

Any reliability impacts caused by the project would act upon the SCE power system.

Existing Cumulative Conditions

The SCE system is projected to serve a peak load, in the year 2013 of nearly 24,000 MW (CEC 2007). SCE currently acquires power from numerous sources, chiefly fossil fuel-fired and nuclear.

Future Foreseeable Projects

The power to serve the SCE system demand would be acquired from numerous sources, some of which would be solar power plants. The GSEP project would contribute up to 250 MW of the total of 24,000 MW, or 1.0 percent. This comprises an insignificant portion of the total; insufficient reliability of GSEP would be unlikely to adversely impact SCE's ability to serve its load.

Foreseeable Renewable Projects in the California and Arizona Desert

Numerous solar, wind power and geothermal projects are foreseeable in the deserts of California and Arizona. The GSEP project would contribute up to 250 MW of the total of 24,000 MW, or 1.0 percent. This comprises an insignificant portion of the total; insufficient reliability of GSEP would be unlikely to adversely impact SCE's ability to

serve its load when combined with the adverse effect of other projects within the SCE system.

D.4.9 COMPLIANCE WITH LORS

No federal, state, or local/county laws, ordinances, regulations, and standards (LORS) apply to the efficiency of this project.

D.3.10 NOTEWORTHY PUBLIC BENEFITS

This project would help serve the need for renewable energy in California, as most of the electricity generated would be produced by a reliable source of energy that is available during the hot summer afternoons, when power is needed most.

D.3.11 PROPOSED CONDITIONS OF CERTIFICATION/MITIGATION MEASURES

No conditions of certification are proposed.

D.3.12 CONCLUSIONS

The applicant predicts an equivalent availability factor of 96-98 percent, which staff believes is achievable. Based on a review of the proposal, staff concludes that the plant would be built and operated in a manner consistent with industry norms for reliable operation. No conditions of certification are proposed.

D.3.13 REFERENCES

GSEP 2009a – Genesis Solar Energy Project/T. Bernhardt (tn:53083) Application for Certification for the Genesis Solar Energy Project. 08/31/2009

McGraw-Hill 1994—McGraw-Hill Energy Information Services Group. 1994. *Operational Experience in Competitive Electric Generation*. Executive Report.

NERC 2007—North American Electric Reliability Corporation. 2007. *2002–2006 Generating Availability Report*.

D.5- TRANSMISSION SYSTEM ENGINEERING

Testimony of Sudath Arachchige and Mark Hesters

D.5.1 SUMMARY OF CONCLUSIONS

The proposed interconnecting facilities including the Genesis Solar Energy Project (GSEP) 230 kV switchyard, the generator 230 kV overhead tie line and termination to the proposed Southern California Edison (SCE) Colorado River 500/230kV substation are adequate and in accordance with industry standards and good utility practices, and are acceptable to staff according to engineering Laws, Ordinances, Regulations and Standards (LORS).

The Phase I Interconnection Study (Phase I Study) does not provide a meaningful forecast of the transmission reliability impacts of the GSEP. The Phase I Study analyzed the impacts of 9,690 MW of generation in the GSEP cluster; however, after a December 2009 milestone most of the generation dropped out of the interconnection process and only 2,200 MW remained. Staff expects that the reliability impacts of 2,200 MW would be significantly smaller than the impacts of 9,690 MW. The California Independent System Operator (California ISO) Phase II Interconnection Study (Phase II Study) will be performed based on the 2,200 MW in the GSEP cluster, which includes the GSEP. The Phase II Study will not be available until September 2010 and thus not incorporated into the staff analysis of the GSEP at this time. Condition of Certification TSE-5 requires that the Phase II Study be provided to the California Energy Commission (Energy Commission) before the start of transmission facility construction.

The GSEP would, therefore, meet the requirements and standards of all applicable LORS upon satisfactory compliance of the proposed TSE Conditions of Certification.

D.5.2 INTRODUCTION

The Transmission System Engineering (TSE) analysis examines whether or not the facilities associated with the proposed interconnection conforms to all applicable LORS required for safe and reliable electric power transmission. Staff's analysis evaluates the power plant switchyard, outlet line, termination and downstream facilities identified by the applicant. Additionally, under the California Environmental Quality Act (CEQA), the Energy Commission must conduct an environmental review of the "whole of the action," which may include facilities not licensed by the Energy Commission (California Code of Regulations, title 14, §15378). Therefore, the Energy Commission must identify the system impacts and necessary new or modified downstream transmission facilities (beyond the first point of the proposed interconnection) that are required for interconnection and represent the "whole of the action." The downstream network upgrade mitigation measures that will be required to maintain system reliability for the addition of the power plant, are used to identify the requirement for any additional CEQA analysis for potential indirect impacts.

According to the previous guidelines, staff relied on the System Impact Study (SIS) and Facility Study (FS) as well as the review of these studies by the agencies responsible for ensuring the adjacent interconnecting grid meets reliability standards. The proposed GSEP would interconnect to the SCE transmission network and requires analysis by SCE and approval by the California ISO. However, the California ISO's generator interconnection study process under the new Large Generator Interconnection Process (LGIP) Tariff is in transition from a queue or serial process to a cluster window process and now uses Phase I and Phase II Studies. The Phase I Study is similar to the former SIS except it is now performed for a group of projects in the same geographical area of a utility that apply for interconnection in the same request window. The Phase II Study is performed after generators in each cluster meet specific milestones required to stay in the generator interconnection queue. The Phase II Study is then performed based on those generators left in the queue. The interconnection studies analyze the effect of the proposed project on the ability of the transmission network to meet reliability standards (California ISO 2009a).

SCE'S ROLE

SCE is responsible for ensuring electric system reliability in the SCE system for addition of the proposed generating plant. SCE will provide the analysis and reports in their Phase I and Phase II Studies, and their approval for the facilities and changes required in the SCE system for addition of the proposed transmission modifications.

CALIFORNIA ISO'S ROLE

The California ISO is responsible for ensuring electric system reliability for all participating transmission owners and is also responsible for developing the standards necessary to achieve system reliability. The California ISO is responsible for completing the studies of the SCE system to ensure adequacy of the proposed transmission interconnection. The California ISO will determine the reliability impacts of the proposed transmission modifications on the SCE transmission system in accordance with all applicable reliability criteria. According to the California ISO Tariff, the California ISO will determine the "Need" for transmission additions or upgrades downstream from the interconnection point to ensure reliability of the transmission grid. The California ISO will, therefore, review the Phase I Study performed by SCE and/or any third party provide their analysis, conclusions and recommendations. Upon completion of the SCE Phase II Study based on the expected mid-2013 commercial operation date (COD) or current COD the California ISO would execute Large Generator Interconnection Agreement (LGIA) between the California ISO and the project owner. If necessary, the California ISO may provide written and verbal testimony on their findings at the Energy Commission hearings.

D.5.3 LAWS, ORDINANCES, REGULATIONS AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction," formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction, maintenance and operation or use of overhead electric lines and to the public in general.

- California Public Utilities Commission (CPUC) General Order 128 (GO-128), “Rules for Construction of Underground Electric Supply and Communications Systems,” formulates uniform requirements and minimum standards to be used for underground supply systems to ensure adequate service and safety to persons engaged in the construction, maintenance and operation or use of underground electric lines and to the public in general.
- The National Electric Safety Code, 1999 provides electrical, mechanical, civil and structural requirements for overhead electric line construction and operation.
- NERC/WECC Planning Standards: The Western Electricity Coordinating Council (WECC) Planning Standards are merged with the North American Electric Reliability Council (NERC) Planning Standards and provide the system performance standards used in assessing the reliability of the interconnected system. These standards require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. Certain aspects of the NERC/WECC standards are either more stringent or more specific than the NERC standards alone. These standards provide planning for electric systems so as to withstand the more probable forced and maintenance outage system contingencies at projected customer demand and anticipated electricity transfer levels, while continuing to operate reliably within equipment and electric system thermal, voltage and stability limits. These standards include the reliability criteria for system adequacy and security, system modeling data requirements, system protection and control, and system restoration. Analysis of the WECC system is based to a large degree on Section I.A of the standards, “NERC and WECC Planning Standards with Table I and WECC Disturbance-Performance Table” and on Section I.D, “NERC and WECC Standards for Voltage Support and Reactive Power”. These standards require that the results of power flow and stability simulations verify defined performance levels. Performance levels are defined by specifying the allowable variations in thermal loading, voltage and frequency, and loss of load that may occur on systems during various disturbances. Performance levels range from no significant adverse effects inside and outside a system area during a minor disturbance (loss of load or a single transmission element out of service) to a level that seeks to prevent system cascading and the subsequent blackout of islanded areas during a major disturbance (such as loss of multiple 500 kV lines along a common right of way, and/or multiple generators). While controlled loss of generation or load or system separation is permitted in certain circumstances, their uncontrolled loss is not permitted (WECC 2006).
- North American Reliability Council (NERC) Reliability Standards for the Bulk Electric Systems of North America provide national policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. The NERC Reliability Standards provide for system performance levels under normal and contingency conditions. With regard to power flow and stability simulations, while these Reliability Standards are similar to NERC/WECC Standards, certain aspects of the NERC/WECC Standards are either more stringent or more specific than the NERC Standards for Transmission System Contingency Performance. The NERC Reliability Standards apply not only to interconnected system operation but also to individual service areas (NERC 2006).

- California ISO Planning Standards also provide standards, and guidelines to assure the adequacy, security and reliability in the planning of the California ISO transmission grid facilities. The California ISO Grid Planning Standards incorporate the NERC/WECC and NERC Reliability Planning Standards. With regard to power flow and stability simulations, these Planning Standards are similar to the NERC/WECC or NERC Reliability Planning Standards for Transmission System Contingency Performance. However, the California ISO Standards also provide some additional requirements that are not found in the WECC/NERC or NERC Standards. The California ISO Standards apply to all participating transmission owners interconnecting to the California ISO controlled grid. They also apply when there are any impacts to the California ISO grid due to facilities interconnecting to adjacent controlled grids not operated by the California ISO (California ISO 2002a).
- California ISO/FERC Electric Tariff provides guidelines for construction of all transmission additions/upgrades (projects) within the California ISO controlled grid. The California ISO determines the “Need” for the proposed project where it will promote economic efficiency or maintain system reliability. The California ISO also determines the Cost Responsibility of the proposed project and provides an Operational Review of all facilities that are to be connected to the California ISO grid (California ISO 2007a).

D.5.4 PROJECT DESCRIPTION

D.5.4.1 SETTING AND EXISTING CONDITIONS

The GSEP will consist of two independent concentrated solar electric generating facilities with a nominal net electrical output of 125 MW each, for a total net electrical output of 250MW. The auxiliary load for each generator would be 20MW, resulting in a maximum net output of 250MW at an 85 percent power factor. The project’s planned operational date is summer of 2013. Each generating unit would be connected to the low side of its dedicated 13.8/230kV generator step-up (GSU) transformer through 15kV, 8000A isolated phase bus duct and an 8000A circuit breaker. The step-up transformer for the steam turbine generating unit would be rated at 13.8/230kV and 90/120/150 MVA at 65 centigrade. The 230kV side of the step-up transformer would be connected through a 1200A disconnect switch to the new Genesis 230kV switchyard. The plant will use parabolic through solar thermal technology to produce electrical power using steam turbine generators (STG) fed from solar steam generators (SSG). The SSG receives heated heat transfer fluid (HTF) from solar thermal equipment comprised of arrays of parabolic mirrors that collect energy from the sun. (GSEP project, 2009b section 3.0, pages 3-8 to 3-9 and Figure 3.4-7). Please see the **Project Description** section of this document for associated graphs and depictions.

SWITCHYARD AND INTERCONNECTION FACILITIES

The project will interconnect to the proposed SCE Colorado River 230/500kV substation as the primary point of interconnection. The plant site switchyard will be located near the unit two power block, and will require an overhead 795 kcmil, steel-reinforced, aluminum conductor unit tie line to interconnect the GSU transformers of each unit. The switchyard will be designed with a ring bus configuration and consist of three breakers and three line take off structures. The power from the switchyard will be transmitted

through a generator tie line that will be routed in a southeasterly ROW eventually connecting to the proposed Southern California Edison 230/500kV Colorado River substation. The 230kV single circuit transmission line will be constructed with 795 kcmil, steel-reinforced, aluminum conductor with a continuous ampacity rating of approximately 906 Amps per conductor or 1816 Amps per bundle. The generator tie line will travel in a southeasterly direction to a point where it will cross the existing Imperial Irrigation District's Blythe to Eagle-Mountain 161 kV transmission line. From the I-10 crossing, the generator tie line will continue south, where it will eventually intersect with the Blythe Energy Project Transmission (BEPTL) line. From that point, the generator tie line will travel east and share a portion of the double circuit transmission poles with the BEPTL where it will eventually terminate at the interconnection point within the proposed Colorado River substation. Each circuit will be supported by mono-pole structures at approximately 800 feet intervals with final heights as determined during detailed design (GSEP project, 2009a section 3.11, page 3-71 and figure 3.4-7 and, 3.6-1, 3.6-2).

D.5.4.2 ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

For the interconnection of a proposed generating unit or transmission facility to the grid, the interconnecting utility and the control area operator are responsible for ensuring grid reliability. For the GSEP, SCE and the California ISO are responsible for ensuring grid reliability.

The California ISO's generator interconnection study process is in transition from a serial process to an interconnection window cluster study process. The GSEP was studied under the window cluster process and the transmission reliability impacts of the proposed project are studied in the Phase I and Phase II Studies. The Phase I Study is similar to the former System Impact Study except it is now performed for a group of projects in the same geographical area of a utility that apply for interconnection in the same request window. The Phase II Study is performed after generators in each cluster meet specific milestones required to stay in the generator interconnection queue. The Phase II Study is then performed based on the number of generators left in each cluster.

The Phase I Studies for projects in the transition cluster were conducted to determine the preferred and alternative generator interconnection methods and to identify any mitigation measures required to ensure system conformance with utility reliability criteria, NERC planning standards, WECC reliability criteria, and California ISO reliability criteria. Staff relies on the studies and any review conducted by the responsible agencies to determine the effect of the projects on the transmission grid and to identify any necessary downstream facilities or indirect project impacts required to bring the transmission network into compliance with applicable reliability standards (NERC2006, WECC 2006, California ISO 2002a, 2007a & 2009a).

The Phase I Study analyzes the grid with and without the generator or generators in a cluster under conditions specified in the planning standards and reliability criteria. The standards and criteria define the assumptions used in the study and establish the thresholds by which grid reliability is determined. The studies must analyze the impact

of the projects for their proposed first year(s) of operation and thus are based on a forecast of loads, generation and transmission. Load forecasts are developed by the interconnected utility, which would be SCE in this case. Generation and transmission forecasts are based on the interconnection queue. The studies are focused on thermal overloads, voltage deviations, system stability (excessive oscillations in generators and transmission system, voltage collapse, loss of loads or cascading outages), short circuit duties and substation evaluation

Under the new California ISO LGIP, generators are able to choose between either “full capacity” or “energy only” depending on whether or not the generator wants to have the right to generate energy 24-hours per day. A generator that chooses the full capacity option will be required to pay for transmission network upgrades that are needed to allow the generator to operate under virtually any system conditions and as such could sign contracts that allowed them to provide capacity to utilities. Energy only generators would not pay for network transmission upgrades, and essentially would have access to as available transmission capacity, and would likely not be able to sign capacity contracts.

If the studies show that the interconnection of the project or cluster of projects causes the grid to be out of compliance with reliability standards, the study will then identify mitigation alternatives or ways in which the grid could be brought into compliance with reliability standards. If the interconnecting utility determines that the only feasible mitigation includes transmission modifications or additions which require CEQA review as part of the “whole of the action,” the Energy Commission must analyze those modifications or additions according to CEQA requirements. Where the Phase I Study identifies transmission modifications required for the reliable interconnection of a cluster of generators, staff will analyze the proposed generating project’s impact on individual reliability criteria violations to determine whether or not the identified mitigation measures are a reasonably foreseeable consequence of the proposed project.

D.5.4.3 SCOPE OF THE TRANSITION CLUSTER PHASE 1 INTERCONNECTION STUDY

The July 28, 2009, Transition Cluster Phase I Study was prepared by the California ISO in coordination with SCE. The Phase I Study includes 15 queue generation projects in the Eastern Riverside County area totaling 9,690 MW net generation output, including the proposed 250 MW GSEP. As of December 4, 2009 only five projects (2,200 MW) of the original 15 projects remain in the interconnection queue. Reducing the size of the cluster by 10 projects and 7,490 MW means the Phase I Study results no longer provide a reasonable forecast of the reliability impacts of the proposed project or the other projects in the cluster. Since the Transition Cluster Phase I Study does not provide an accurate forecast of the reliability impacts of the cluster or the proposed GSEP, staff cannot rely on the study results to show project compliance with LORS and identify the transmission facilities required to reliably interconnect a generator to the existing transmission grid.

CEQA requires the analysis of reasonably foreseeable consequences of proposed projects based on the best available information. The California ISO is the reliability authority for generator interconnections and its Phase I Study for the GSEP provides

the best available information on the reliability impacts of the proposed project. However, the significant reduction in the number of generators studied in the cluster with the GSEP reduces the study results to idle speculation. It is not possible to determine the impacts of the proposed project or even the cluster of generators because the size of the cluster has decreased so dramatically. The revised 2,200 MW cluster will be analyzed in the Phase II Study and will provide a much better forecast of the reliability impacts of the GSEP and its associated cluster of generators.

The Phase II Study for the Transition Cluster is currently scheduled to be completed by September of 2010 and would not be available in time to be incorporated in staff's analysis of the GSEP. If the Phase II Study finds that the GSEP and the remaining projects in its cluster would require the construction or upgrade of transmission facilities in order to maintain grid reliability, those transmission facilities would require a license from the California Public Utilities Commission or other permitting authority. Staff anticipates that future clusters will likely include fewer generators and the Phase I Studies which are not part of the Transition Cluster will provide less speculative study results and a better forecast of the reasonably foreseeable transmission impacts of a specific generator.

D.5.4.4 CEQA Level of Significance

Generally staff relies on the California ISO Phase I /System Impact Study to determine whether or not the proposed generation project will likely comply with reliability and to identify the transmission facilities required for reliable interconnection. For the Transition Cluster projects the Phase I Study does not provide an accurate forecast of impacts of the GSEP on the SCE transmission grid. The transmission upgrades identified in the Phase I Study are not reasonably foreseeable consequences of the proposed generating project. Relying on available information, staff is unable to identify any likely indirect project transmission impacts. Upon completion of the Phase II Study and the execution of the LGIA, the impacts of the GSEP on grid reliability will be identified. In order to ensure compliance with reliability LORS, Condition of Certification TSE-5 requires the submittal of the Phase II Study and the executed LGIA prior to the start of construction of transmission facilities (2009d, Phase I Interconnection Study report).

D.5.4.4.1 DOWNSTREAM FACILITIES

The Phase II Study will determine what, if any, downstream reliability upgrades outside the existing substation fence lines will be needed to accommodate the proposed GSEP. The study will include the California ISO's approved transmission projects in the SCE east of Lugo area network. The California Public Utilities Commission would be the lead agency for the CEQA analysis of any downstream transmission facilities identified in the Phase II Study. Major facilities would require a Certificate of Public Convenience and Necessity (CPCN) and any facilities impacting federal lands could also require an environmental analysis consistent with the National Environmental Policy Act.

D.5.5 REDUCED ACREAGE ALTERNATIVE

The Reduced Acreage Alternative would essentially be Unit 1 of the proposed project, including a 125 MW solar facility located within the boundaries of the proposed project

as defined by NextEra. This alternative is analyzed for two major reasons: (1) it eliminates about 50 percent of the proposed project area so all impacts are reduced, and (2) by eliminating the eastern solar field, it would reduce the water required for wet cooling by 50 percent. The boundaries of the Reduced Acreage Alternative are shown in **Alternatives Figure 1**.

D.5.5.1 Setting and Existing Conditions

This alternative is located entirely within the boundaries of the proposed project. It simply eliminates effects to the eastern 125 MW solar field and relocates the gas yard approximately 1.75 miles northwest of its present location. As a result, the environmental setting consists of the western portion of the proposed project, as well as the area affected by the linear project components.

D.5.5.2 Assessment of Impacts and Discussion of Mitigation

A smaller, 125 MW, project would likely have fewer impacts on existing transmission facilities than the proposed project but these impacts would be identified through the California ISO's LGIP.

D.5.5.3 CEQA Level of Significance

As stated above, the Reduced Acreage Alternative is evaluated in this SA/DEIS because it would reduce some impacts of the project. Additionally, the Reduced Acreage Alternative would allow the applicant to contribute clean, renewable energy to help meet the State's energy goals, while minimizing impacts to the desert environment.

D.5.6 DRY COOLING ALTERNATIVE

D.5.7 NO PROJECT/NO ACTION ALTERNATIVES

D.5.7.1 NO PROJECT/NO ACTION ALTERNATIVE #1:

No Action on Genesis Solar Energy Project application and on California Desert Conservation Area land use plan amendment

Under this alternative, the proposed Genesis Solar Energy Project would not be approved by the CEC and BLM, and BLM would not amend the California Desert Conservation Area (CDCA) Plan. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because there would be no amendment to the CDCA Plan and no solar project approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition, with no new structures or facilities constructed or operated on the site and no ground disturbance. Because the project would not be built, the proposed interconnection would not be required and no impacts to safe and reliable electric power transmission would occur. However, the land on which the project is proposed would become available for other uses that are consistent with BLM's land use plan, including another solar project requiring a land use plan amendment. In

addition, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations

D.5.7.2 NO PROJECT/NO ACTION ALTERNATIVE #2:

No Action on Genesis Solar Energy Project and amend the CDCA land use plan to make the area available for future solar development

Under this alternative, the proposed Genesis Solar Energy Project would not be approved by the CEC and BLM, and BLM would amend the CDCA Land Use Plan of 1980, as amended, to allow for other solar projects on the site. As a result, it is possible that another solar energy project could be constructed on the project site.

Because the CDCA Plan would be amended, it is possible that the site will be developed with another solar technology. The different solar technology would require a transmission line and laws, ordinances, regulations, and standards required for safe and reliable electric power transmission would be similar to those under the proposed project.

D.5.7.3 NO PROJECT/NO ACTION ALTERNATIVE #3:

No Action on Genesis Solar Energy Project application and amend the CDCA land use plan to make the area unavailable for future solar development

Under this alternative, the proposed Genesis Solar Energy Project would not be approved by the CEC and BLM, and the BLM would amend the CDCA Plan to make the proposed site unavailable for future solar development. As a result, no solar energy project would be constructed on the project site and BLM would continue to manage the site consistent with the existing land use designation in the CDCA Land Use Plan of 1980, as amended.

Because the CDCA Plan would be amended so no solar projects can be approved for the site under this alternative, it is expected that the site would continue to remain in its existing condition, with no construction of a solar facility. Therefore, the proposed transmission line would not be required and no impacts to safe and reliable electric power transmission would occur. However, in the absence of this project, other renewable energy projects may be constructed to meet State and Federal mandates, and those projects would have similar impacts in other locations.

D.5.8 CUMULATIVE IMPACTS

Staff has reviewed the lists of existing and foreseeable projects as presented in the Cumulative Scenario section of this SA/DEIS. Staff's review considers whether the interconnection of GSEP to SCE's transmission system along with other existing and foreseeable generation projects would conform to all LORS required for safe and reliable electric power transmission. The analysis described above under the heading Proposed Project - Scope of System Impact Studies is conducted in coordination with, and the approval of, the California ISO to consider existing and proposed generator

interconnections to the transmission grid and their potential safety and reliability impacts under a number of conservative contingency conditions.

The cumulative marginal impacts to the safe and reliable operation of the transmission system due to the GSEP project, as identified in the Phase II Study, would be mitigated with the Energy Commission's and BLM's incorporation of the mitigation measures and COC's set forth in this section.

D.5.9 COMPLIANCE WITH LORS

The proposed interconnection facilities including the GSEP 230 kV switchyard, generator 230 kV overhead tie line to the new SCE Genesis 230 kV substation and its termination at the new 230 kV substation are adequate in accordance with industry standards and good utility practices, and are acceptable to staff according to engineering LORS.

The Phase I Study results were found very speculative and inaccurate due to inclusion of 9,690 MW cluster generation projects including the GSEP. The Phase II Study would be performed with only 2,200 MW active cluster generation projects including the GSEP.

Consequently after execution of the LGIA with the applicant, the California ISO/SCE would proceed through the California Public Utility Commission's Certificate of Public Convenience and Necessity (CPCN) permit process for construction of facilities, which would include necessary CEQA analysis.

The GSEP would, therefore, meet the requirements and standards of all applicable LORS upon satisfactory compliance of the proposed TSE Conditions of Certification.

D.5.10 PROPOSED CONDITIONS OF CERTIFICATIONS/MITIGATION MEASURES

TSE-1 The project owner shall furnish to the CPM and to the CBO a schedule of transmission facility design submittals, a Master Drawing List, a Master Specifications List, and a Major Equipment and Structure List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide designated packages to the CPM when requested.

Verification: Prior to the start of construction, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major equipment in Table 1: Major Equipment List below). Additions and

deletions shall be made to the table only with CPM and CBO approval. The project owner shall provide schedule updates in the Monthly Compliance Report.

| Table 1: Major Equipment List |
|--------------------------------------|
| Breakers |
| Step-up transformer |
| Switchyard |
| Busses |
| Surge arrestors |
| Disconnects |
| Take-off facilities |
| Electrical control building |
| Switchyard control building |
| Transmission pole/tower |
| Grounding system |

- TSE-2** Before the start of construction, the project owner shall assign to the project an electrical engineer and at least one of each of the following:
- a) a civil engineer;
 - b) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering;
 - c) a design engineer who is either a structural engineer or a civil engineer and fully competent and proficient in the design of power plant structures and equipment supports; or
 - d) a mechanical engineer (Business and Professions Code Sections 6704 et seq. require state registration to practice as either a civil engineer or a structural engineer in California).

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers as long as each engineer is responsible for a particular segment of the project, e.g., proposed earthwork, civil structures, power plant structures, or equipment support. No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The civil, geotechnical, or civil and design engineer, assigned as required by Facility Design Condition **GEN-5**, may be responsible for design and review of the TSE facilities.

The project owner shall submit to the CBO, for review and approval, the names, qualifications, and registration numbers of all engineers assigned to the project. If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. This engineer shall be authorized to halt earth work and require changes; if site conditions are unsafe or do not

conform with the predicted conditions used as the basis for design of earth work or foundations.

The electrical engineer shall:

1. be responsible for the electrical design of the power plant switchyard, outlet, and termination facilities; and
2. sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: Prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications, and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

TSE-3 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend corrective action (2001 California Building Code, Chapter 1, section 108.4, approval required; Chapter 17, section 1701.3, *Duties and Responsibilities of the Special Inspector*; Appendix Chapter 33, section 3317.7, *Notification of Noncompliance*). The discrepancy documentation shall become a controlled document and shall be submitted to the CBO for review and approval and refer to this condition of certification.

Verification: The project owner shall submit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days of receipt. If disapproved, the project owner shall advise the CPM, within five days, the reason for the disapproval, along with the revised corrective action required to obtain the CBO's approval.

TSE-4 For the power plant switchyard, outlet line and termination, the project owner shall not begin any construction until plans for that increment of construction have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. The following activities shall be reported in the monthly compliance report:

- a) receipt or delay of major electrical equipment;
- b) testing or energization of major electrical equipment; and

- c) the number of electrical drawings approved, submitted for approval, and still to be submitted.

Verification: Prior to the start of each increment of construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for equipment and systems of the power plant switchyard, and outlet line and termination, including a copy of the signed and stamped statement from the responsible electrical engineer verifying compliance with all applicable LORS, and send the CPM a copy of the transmittal letter in the next monthly compliance report.

TSE-5 The project owner shall ensure that the design, construction, and operation of the proposed transmission facilities will conform to all applicable LORS, and the requirements listed below. The project owner shall submit the required number of copies of the design drawings and calculations, as determined by the CBO.

- a) The power plant outlet line shall meet or exceed the electrical, mechanical, civil, and structural requirements of CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the *High Voltage Electric Safety Orders*, California ISO standards, National Electric Code (NEC) and related industry standards.
- b) Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
- c) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.
- d) The project conductors shall be sized to accommodate the full output of the project.
- e) Termination facilities shall comply with applicable SCE interconnection standards.
- f) The project owner shall provide to the CPM:
 - i) The Special Protection System (SPS) sequencing and timing if applicable,
 - ii) A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation, for which the project is responsible, are acceptable,
 - iii) The final Phase II Interconnection Study, including a description of facility upgrades, operational mitigation measures, and/or special protection system sequencing and timing if applicable; and
 - iv) A copy of the executed LGIA signed by the California ISO and the project owner.

Verification: Prior to the start of construction of transmission facilities (or fewer days if mutually agreed upon by the project owner and CBO), the project owner shall submit to the CBO for approval:

- a) Design drawings, specifications, and calculations conforming with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the *High Voltage Electric Safety Orders*, CA ISO standards, National Electric Code (NEC) and related industry standards, for the poles/towers, foundations, anchor bolts, conductors, grounding systems, and major switchyard equipment;
- b) For each element of the transmission facilities identified above, the submittal package to the CBO shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on “worst case conditions”¹ and a statement signed and sealed by the registered engineer in responsible charge, or other acceptable alternative verification, that the transmission element(s) will conform with CPUC General Order 95 or National Electric Safety Code (NESC); Title 8 of the California Code and Regulations (Title 8); Articles 35, 36 and 37 of the *High Voltage Electric Safety Orders*, California ISO standards, National Electric Code (NEC), and related industry standards;
- c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in charge, a route map, and an engineering description of the equipment and configurations covered by requirements **TSE-5** a) through f), above;
- d) The Special Protection System (SPS) sequencing and timing if applicable shall be provided concurrently to the CPM.
- e) A letter stating that the mitigation measures or projects selected by the transmission owners for each reliability criteria violation, for which the project is responsible, are acceptable,
- f) The final Phase II Interconnection Study, including a description of facility upgrades, operational mitigation measures, and/or special protection system sequencing and timing if applicable, and
- g) A copy of the executed LGIA signed by the California ISO and the project owner.

TSE-6 The project owner shall inform the CPM and CBO of any impending changes that may not conform to requirements **TSE-5** a) through f), and have not received CPM and CBO approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or substation configurations shall not begin without prior written approval of the changes by the CBO and the CPM.

¹ Worst-case conditions for the foundations would include for instance, a dead-end or angle pole.

Verification: Prior to the construction of transmission facilities, the project owner shall inform the CBO and the CPM of any impending changes that may not conform to requirements of **TSE-5** and request approval to implement such changes.

TSE-7 The project owner shall provide the following Notice to the California Independent System Operator (California ISO) prior to synchronizing the facility with the California Transmission system:

1. At least one week prior to synchronizing the facility with the grid for testing, provide the California ISO a letter stating the proposed date of synchronization; and
2. At least one business day prior to synchronizing the facility with the grid for testing, provide telephone notification to the California ISO Outage Coordination Department.

Verification: The project owner shall provide copies of the California ISO letter to the CPM when it is sent to the California ISO one week prior to initial synchronization with the grid. The project owner shall contact the California ISO Outage Coordination Department, Monday through Friday, between the hours of 0700 and 1530 at (916) 351-2300 at least one business day prior to synchronizing the facility with the grid for testing. A report of conversation with the California ISO shall be provided electronically to the CPM one day before synchronizing the facility with the California transmission system for the first time.

TSE-8 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction, and any subsequent CPM and CBO approved changes thereto, to ensure conformance with CPUC GO-95 or NESC, Title 8, CCR, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", applicable interconnection standards, NEC and related industry standards. In case of non-conformance, the project owner shall inform the CPM and CBO in writing, within 10 days of discovering such non-conformance and describe the corrective actions to be taken.

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM and CBO:

- a) "As built" engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95 or NESC, Title 8, California Code of Regulations, Articles 35, 36 and 37 of the, "High Voltage Electric Safety Orders", and applicable interconnection standards, NEC, related industry standards, and these conditions shall be provided concurrently.
- b) An "as built" engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge or acceptable alternative verification. "As built" drawings of the electrical, mechanical, structural, and civil portion of the transmission facilities shall be maintained at the power plant and made available, if requested, for CPM audit as set forth in the "Compliance Monitoring Plan".

- c) A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in charge.

D.5.11 CONCLUSIONS

1. The proposed interconnection facilities including the GSEP 230 kV switchyard, generator 230 kV overhead tie line and termination at the proposed SCE Colorado River 230 kV are adequate, in accordance with industry standards and good utility practices, and are acceptable to staff according to engineering LORS.
2. The Phase I Study does not provide a meaningful forecast of the transmission reliability impacts of the GSEP. The Phase I Study analyzed the impacts of 9,690 MW of generation in the GSEP cluster; however, after a December 2009 milestone most of the generation dropped out of the interconnection process and only 2,200 MW remained. Staff expects that the reliability impacts of 2,200 MW would be significantly smaller than the impacts of 9,690 MW. The California ISO Phase II Study will be performed based on the 2,200 MW in the GSEP cluster, which includes the GSEP. The Phase II Study will not be available until September 2010 and thus not incorporated into the staff analysis of the GSEP. Consequently after completion of the Phase II Study and execution of the LGIA with applicant, the California ISO/SCE would proceed through the California Public Utilities Commission's CPCN permit process for construction of facilities, which would include necessary CEQA analysis.
3. The GSEP would, therefore, meet the requirements and standards of all applicable LORS upon satisfactory compliance of the proposed TSE Conditions of Certification.
4. The GSEP, as local solar generation, would provide clean renewable energy towards meeting state mandate and goals.

D.5.12 REFERENCES

California ISO (California Independent System Operator) 1998a. California ISO Tariff Scheduling Protocol posted April 1998, Amendments 1,4,5,6, and 7 incorporated.

California ISO (California Independent System Operator) 1998b. California ISO Dispatch Protocol posted April 1998.

California ISO (California Independent System Operator) 2002a. California ISO Planning Standards, February 7, 2002.

California ISO (California Independent System Operator) 2007a. California ISO, FERC Electric Tariff, First Replacement Vol. No. 1, March, 2007.

California ISO 2009a - California Independent System Operator, Large Generator Interconnection Procedures, dated 8/18/2009.

GSEP 2009b: Genesis Solar Energy Project. Application for Certification (AFC) for the GSEP, Submitted on 08-30-2009.

CA ISO Transition cluster Phase 1 Interconnection Study Report dated August 05, 2009. Submitted on 10-09.

NERC (North American Electric Reliability Council) 2006. Reliability Standards for the Bulk Electric Systems of North America, May 2 2006.

WECC (Western Electricity Coordinating Council) 2006. NERC/WECC Planning Standards, August 2006.

D.5.13 DEFINITION OF TERMS

| | |
|------------------------------|--|
| AAC | All aluminum conductor |
| ACSR | Aluminum conductor steel-reinforced |
| ACSS | Aluminum conductor steel-supported |
| Ampacity | Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations |
| Ampere | The unit of current flowing in a conductor |
| Bundled | Two wires, 18 inches apart |
| Bus | Conductors that serve as a common connection for two or more circuits |
| Conductor | The part of the transmission line (the wire) that carries the current. |
| Congestion Management | A scheduling protocol that ensures dispatched generation and transmission loading (imports) will not violate criteria |
| Double Contingency | Also known as emergency or N-2 condition, occurs when a forced outage of two system elements occurs -- usually (but not exclusively) caused by one single event. Examples of an N-2 contingency include loss of two transmission circuits on single tower line or loss of two elements connected by a common circuit breaker due to the failure of that common breaker |
| Emergency Overload | See Single Contingency condition. This is also called an N-1. |
| Kcmil or KCM | Thousand circular mil. A unit of the conductor's cross sectional area; when divided by 1,273, the area in square inches is obtained. |
| Kilovolt (kV) | A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground |
| Loop | An electrical cul de sac. A transmission configuration that interrupts an existing circuit, diverts it to another connection, and returns it back to the interrupted circuit, thus forming a loop or cul de sac |
| Megavar | One megavolt ampere reactive |

Megavars Mega-volt-ampere-reactive. One million volt-ampere-reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system

Megavolt Ampere (MVA)

A unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, divided by 1,000

Megawatt (MW)

A unit of power equivalent to 1,341 horsepower

N-0 Condition

See Normal Operation/Normal Overload, below

Normal Operation/ Normal Overload (N-0)

When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating

N-1 Condition

See Single Contingency, below

N-2 Condition

See Double Contingency, above

Outlet Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities with the main grid

Power Flow Analysis

A power flow analysis is a forward-looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers, and other equipment and system voltage levels

Reactive Power

Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system

Remedial Action Scheme

A remedial action scheme is an automatic control provision that, as one example, will trip a selected generating unit when a circuit overloads

SF6 Sulfur hexafluoride is an insulating medium

Single Contingency

Also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service

Solid Dielectric Cable

Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket

Special Protection Scheme/System

Detects a transmission outage (either a single or credible multiple contingency) or an overloaded transmission facility and then trips or runs back generation output to avoid potential overloaded facilities or other criteria violations

Switchyard A power plant switchyard is an integral part of a power plant that is used as an outlet for one or more electric generators

Thermal Rating See ampacity.

TSE Transmission System Engineering

Tap A transmission configuration that creates an interconnection through a short single circuit to a small or medium-sized load or generator. The new single circuit line is inserted into an existing circuit by utilizing breakers at existing terminals of the circuit, rather than installing breakers at the interconnection in a new switchyard.

Undercrossing

A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

E - JOINT AGENCY GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Mary Dyas

E.1 INTRODUCTION

The project's General Compliance Conditions of Certification, including Compliance Monitoring and Closure Plan (Compliance Plan) have been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in compliance with public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission and specified in the written decision on the Application for Certification or otherwise required by law. The Compliance Plan will be integrated with a U.S. Bureau of Land Management (BLM) Compliance Monitoring Plan (hereafter referred to as the Compliance Plan) to assure compliance with the terms and conditions of any approved Right-of-Way (ROW) grant including the approved Plan of Development (POD).

The Compliance Plan is composed of elements that:

- set forth the duties and responsibilities of BLM's Authorized Officer, the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
- set forth the requirements for handling confidential records and maintaining the compliance record;
- state procedures for settling disputes and making post-certification changes;
- state procedures for requesting and approving ROW Grant or POD changes;
- state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all BLM and Energy Commission approved conditions of certification/mitigation measures;
- establish requirements for modifications or amendments to facility closure, revegetation, and restoration plans; and
- specify conditions of certification for each technical area containing the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure below a level of significance. Each specific condition of certification also includes a verification provision that describes the method of assuring that the condition has been satisfied.

Conditions of Certification referred to herein serve the purpose of both the Energy Commission's Conditions of Certification for purposes of the California Environmental Quality Act (CEQA) and BLM's Mitigation Measures for purposes of the National Environmental Policy Act (NEPA).

E.2 DEFINITIONS

The following terms and definitions are used to establish when Conditions of Certification are implemented.

BLM AUTHORIZED OFFICER:

The BLM Authorized Officer for the Project is the BLM Palm Springs-South Coast Field Manager or his designated Compliance Inspector that is responsible for oversight and inspection of all construction and operational related activities on BLM-administered land.

PRE-CONSTRUCTION SITE MOBILIZATION

Site mobilization is limited preconstruction activities at the site to allow for the installation of fencing, construction trailers, construction trailer utilities, and construction trailer parking at the site. Limited ground disturbance, grading, and trenching associated with the above mentioned pre-construction activities is considered part of site mobilization. Walking, driving or parking a passenger vehicle, pickup truck and light vehicles is allowable during site mobilization.

CONSTRUCTION

Onsite work to install permanent equipment or structures for any facility.

Ground Disturbance

Construction-related ground disturbance refers to activities that result in the removal of top soil or vegetation at the site beyond site mobilization needs, and for access roads and linear facilities.

Grading, Boring, and Trenching

Construction-related grading, boring, and trenching refers to activities that result in subsurface soil work at the site and for access roads and linear facilities, e.g., alteration of the topographical features such as leveling, removal of hills or high spots, moving of soil from one area to another, and removal of soil.

Notwithstanding the definitions of ground disturbance, grading, boring and trenching above, construction does not include the following:

1. the installation of environmental monitoring equipment;
2. a soil or geological investigation;
3. a topographical survey;
4. any other study or investigation to determine the environmental acceptability or feasibility of the use of the site for any particular facility; and
5. any work to provide access to the site for any of the purposes specified in "Construction" 1, 2, 3, or 4 above.

START OF COMMERCIAL OPERATION

For compliance monitoring purposes, “commercial operation” begins after the completion of start-up and commissioning, when each of the power plants has reached reliable steady-state production of electricity at the rated capacity. At the start of commercial operation, plant control is usually transferred from the construction manager to the plant operations manager.

E.3 BLM’S AUTHORIZED OFFICER AND COMPLIANCE PROJECT MANAGER RESPONSIBILITIES

BLM’s Authorized Officer (AO) and the Compliance Project Manager (CPM) shall oversee the compliance monitoring and is responsible for:

1. Ensuring that the design, construction, operation, and closure of the project facilities are in compliance with the terms and conditions of BLM’s ROW Grant and the Energy Commission Decision
2. Resolving complaints
3. Processing post-certification changes to the conditions of certification, project description (petition to amend), and ownership or operational control (petition for change of ownership) (See instructions for filing petitions)
4. Documenting and tracking compliance filings
5. Ensuring that compliance files are maintained and accessible

BLM’s AO is the contact person for BLM and will consult with appropriate responsible agencies, Energy Commission, and Energy Commission staff when handling disputes, complaints, and amendments. The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies, BLM, Energy Commission, and Energy Commission staff when handling disputes, complaints, and amendments.

All project compliance submittals are submitted to BLM’s AO and the CPM for processing. Where a submittal required by a condition of certification requires BLM’s AO and/or CPM approval, the approval will involve all appropriate BLM personnel, Energy Commission staff and management. All submittals must include searchable electronic versions (pdf or word files).

E.4 CHIEF BUILDING OFFICIAL RESPONSIBILITIES

The Chief Building Official (CBO) shall serve as BLM’s and the Energy Commission’s delegate to assure the project is designed and constructed in accordance with BLM’s Right-of-Way Grant, the Energy Commission’s Decision including Conditions of Certification, California Building Standards Code, local building codes and applicable laws, ordinances, regulations and standards to ensure health and safety. The CBO is

typically made-up of a team of specialists covering civil, structural, mechanical and electrical disciplines whose duties include the following:

1. Performing design review and plan checks of all drawings, specifications and procedures;
2. Conducting construction inspection;
3. Functioning as BLM's and the Energy Commission's delegate including reporting noncompliance issues or violations to the BLM Authorized Officer for action and taking any action allowed under the California Code of Regulations, including issuing a Stop Work Order, to ensure compliance;
4. Exercising access as needed to all project owner construction records, construction and inspection procedures, test equipment and test results; and
5. Providing weekly reports on the status of construction to BLM's Authorized Officer and the CPM.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

BLM's AO and the CPM shall schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings is to assemble BLM's, the Energy Commission's and project owner's technical staff and construction contractor to review the status of all pre-construction or pre-operation requirements, contained in BLM's Right-of-Way Grant and the Energy Commission's conditions of certification. This is to confirm that all applicable conditions of certification have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings ensure, to the extent possible, that BLM and Energy Commission conditions will not delay the construction and operation of the plant due to oversight and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process must be publicly noticed unless they are confined to administrative issues and processes.

BLM AND ENERGY COMMISSION RECORD

BLM and the Energy Commission shall maintain the following documents and information as a public record, in either the Energy Commission's Compliance file or Dockets file, and the BLM Case File for the life of the project (or other period as required):

- All documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
- All monthly and annual compliance reports filed by the project owner;
- All complaints of noncompliance filed with BLM and the Energy Commission; and
- All petitions/requests for project or condition of certification changes and the resulting BLM, Energy Commission staff or Energy Commission action.

E.5 PROJECT OWNER RESPONSIBILITIES

The project owner is responsible for ensuring that the compliance conditions of certification and all other conditions of certification that appear in BLM's ROW Grant and the Energy Commission Decision are satisfied. The compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, conditions of certification, or ownership. Failure to comply with any of the conditions of certification or the compliance conditions may result in reopening of the case and revocation of the Energy Commission certification; an administrative fine; or other action as appropriate. A summary of the Compliance Conditions of Certification is included as Compliance Table 1 at the conclusion of this section. The BLM ROW grant holder will comply with the terms, conditions, and special stipulations of the ROW grant. Failure to comply with applicable laws or regulations or any of the terms and conditions of a BLM ROW grant may result in the suspension or termination of the ROW grant (43 CFR 2807.17). Prior to suspending or terminating a ROW grant, BLM will provide written notice to the holder stating it intends to suspend or terminate and will provide reasonable opportunity to correct any noncompliance.

E.6 COMPLIANCE MITIGATION MEASURES/CONDITIONS OF CERTIFICATION

UNRESTRICTED ACCESS (COMPLIANCE-1)

BLM's AO, responsible BLM staff, the CPM, responsible Energy Commission staff, and delegated agencies or consultants shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on-site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although BLM's AO and the CPM will normally schedule site visits on dates and times agreeable to the project owner, BLM's AO and the CPM reserve the right to make unannounced visits at any time.

COMPLIANCE RECORD (COMPLIANCE-2)

The project owner shall maintain project files on-site or at an alternative site approved by BLM's AO and the CPM for the life of the project, unless a lesser period of time is specified by the conditions of certification. The files shall contain copies of all "as-built" drawings, documents submitted as verification for conditions, and other project-related documents. As-built drawings of all facilities including linear facilities shall be provided to the BLM AO for inclusion in the BLM administrative record within 90-days of completion of that portion of the facility or project.

BLM and Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files maintained pursuant to this condition.

COMPLIANCE VERIFICATION SUBMITTALS (COMPLIANCE-3)

Each condition of certification is followed by a means of verification. The verification describes the Energy Commission's procedure(s) to ensure post-certification

compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified as necessary by BLM's AO and the CPM.

Verification of compliance with the conditions of certification can be accomplished by the following:

1. Monthly and/or annual compliance reports filed by the project owner or authorized agent, reporting on work done and providing pertinent documentation, as required by the specific conditions of certification;
2. Appropriate letters from delegate agencies verifying compliance;
3. BLM and Energy Commission staff audits of project records; and/or
4. BLM and Energy Commission staff inspections of work, or other evidence that the requirements are satisfied.

Verification lead times associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. The cover letter subject line shall identify the project by AFC and BLM case file numbers, the appropriate condition(s) of certification by condition number(s), and a brief description of the subject of the submittal. The project owner shall also identify those submittals not required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal and BLM/CEC submittal number.

The project owner is responsible for the delivery and content of all verification submittals to the BLM's AO and CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All hardcopy submittals shall be addressed to each of the following:

John Kalish, Field Manager
CACA-48811
U.S. Bureau of Land Management
Palm Springs-South Coast Field Office
1201 Bird Center Drive
Palm Springs, CA 92262

Mary Dyas, CPM
(09-AFC-9C)
California Energy Commission
1516 Ninth Street, MS-2000
Sacramento, CA 95814

Those submittals shall be accompanied by a searchable electronic copy, on a CD or by e-mail, as agreed upon by BLM's AO and the CPM.

If the project owner desires BLM and/or Energy Commission staff action by a specific date, that request shall be made in the submittal cover letter and shall include a detailed explanation of the effects on the project if that date is not met.

PRE-CONSTRUCTION MATRIX AND TASKS PRIOR TO START OF CONSTRUCTION (COMPLIANCE-4)

Prior to commencing construction, a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to BLM's AO and the CPM. This matrix will be included with the project owner's first compliance submittal or prior to the first pre-construction meeting, whichever comes first. It will be submitted in the same format as the compliance matrix described below. In order to begin any on-site mobilization or surface disturbing activities on public land, the BLM AO must approve a written Notice to Proceed (NTP). NTPs will be phased as appropriate to facilitate timely implementation of construction.

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and BLM's AO and the CPM have issued a letter and BLM has issued a NTP to the project owner authorizing construction. Various lead times for submittal of compliance verification documents to BLM's AO and the CPM for conditions of certification are established to allow sufficient BLM and Energy Commission staff time to review and comment and, if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

Failure to submit compliance documents within the specified lead-time may result in delays in authorization to commence various stages of project development.

If the project owner anticipates commencing project construction as soon as the project is certified, it may be necessary for the project owner to file compliance submittals prior to project certification. Compliance submittals should be completed in advance where the necessary lead time for a required compliance event extends beyond the date anticipated for start of construction. The project owner must understand that the submittal of compliance documents prior to project certification is at the owner's own risk. Any approval by Energy Commission staff is subject to change, based upon BLM's ROW Grant and the Energy Commission Decision.

Compliance Reporting

There are two different compliance reports that the project owner must submit to assist BLM's AO and the CPM in tracking activities and monitoring compliance with the terms and conditions of BLM's ROW Grant and the Energy Commission Decision. During construction, the project owner or authorized agent will submit monthly compliance reports. During operation, an annual compliance report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to BLM's AO and the CPM in the monthly or annual compliance reports.

POSTING OF A SURETY BOND (COMPLIANCE-5)

Prior to site disturbance and each increment of construction, the project owner shall post a surety bond adequate to cover the cost of decommissioning and restoration, including the removal of the project features that have been constructed for that portion of the site and restoring the native topography and vegetation. An “increment of construction” shall mean a significant feature of construction, such as site grading, a building, a fluid storage tank, a water treatment facility, a hydrogen production facility, a switchyard, or a group of solar collectors connected to an electrical transformer (including that transformer). This Surety bond will apply to all site disturbance features.

The project owner shall provide the surety bond to the BLM AO for approval and to the CPM for review with written evidence indicating that the surety bond is adequate to cover the cost of decommissioning and removing the project features constructed, allowing for site restoration. The written evidence shall include a valid estimate showing that the amount of the bond is adequate to accomplish such work. The timing for the submittal of the surety bond and approval of this document shall be coordinated with the BLM AO and CPM. Over the life of the project, the surety bond will be updated as necessary to account for any changes to the project description and/or decommissioning costs.

COMPLIANCE MATRIX (COMPLIANCE-6)

A compliance matrix shall be submitted by the project owner to BLM’s AO and the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide BLM’s AO and the CPM with the current status of all conditions of certification in a spreadsheet format. The compliance matrix must identify:

1. the technical area;
2. the condition number;
3. a brief description of the verification action or submittal required by the condition;
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.);
5. the expected or actual submittal date;
6. the date a submittal or action was approved by the Chief Building Official (CBO), BLM’s AO, CPM, or delegate agency, if applicable; and
7. the compliance status of each condition, e.g., “not started,” “in progress” or “completed” (include the date).
8. if the condition was amended, the date of the amendment.

Satisfied conditions shall be placed at the end of the matrix.

MONTHLY COMPLIANCE REPORT (COMPLIANCE-7)

The first monthly compliance report is due one month following the Energy Commission business meeting date upon which the project was approved, unless otherwise agreed to by BLM’s AO and the CPM. The first monthly compliance report shall include the AFC

and BLM case file numbers and an initial list of dates for each of the events identified on the Key Events List. The Key Events List Form is found at the end of this section.

During pre-construction and construction of each power plant, the project owner or authorized agent shall submit an original and an electronic searchable version of the monthly compliance report within 10 working days after the end of each reporting month or other period of time agreed to by BLM's AO and the CPM. Monthly compliance reports shall be clearly identified for the month being reported. The reports shall contain, at a minimum:

1. A summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. Documents required by specific conditions to be submitted along with the monthly compliance report. Each of these items must be identified in the transmittal letter, as well as the conditions they satisfy and submitted as attachments to the monthly compliance report;
3. An initial, and thereafter updated, compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);
4. A list of conditions that have been satisfied during the reporting period, and a description or reference to the actions that satisfied the condition;
5. A list of any submittal deadlines that were missed, accompanied by an explanation and an estimate of when the information will be provided;
6. A cumulative listing of any approved changes to conditions of certification;
7. A listing of any filings submitted to, or permits issued by, other governmental agencies during the month;
8. A projection of project compliance activities scheduled during the next two months. The project owner shall notify BLM's AO and the CPM as soon as any changes are made to the project construction schedule that would affect compliance with conditions of certification;
9. A listing of the month's additions to the on-site compliance file; and
10. A listing of complaints, notices of violation, official warnings, and citations received during the month, a description of the resolution of the resolved actions, and the status of any unresolved actions.

All sections, exhibits, or addendums shall be separated by tabbed dividers or as acceptable by BLM's AO and the CPM.

ANNUAL COMPLIANCE REPORT (COMPLIANCE-8)

After construction of each power plant is complete or when a power plant goes into commercial operations, the project owner shall submit annual compliance reports instead of monthly compliance reports. The reports are for each year of commercial operation and are due to BLM's AO and the CPM each year at a date agreed to by BLM's AO and the CPM. Annual compliance reports shall be submitted over the life of

the project unless otherwise specified by BLM's AO and the CPM. Each annual compliance report shall include the AFC and BLM case file numbers, identify the reporting period and shall contain the following:

1. An updated compliance matrix showing the status of all conditions of certification (fully satisfied conditions do not need to be included in the matrix after they have been reported as completed);
2. A summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. Documents required by specific conditions to be submitted along with the annual compliance report. Each of these items must be identified in the transmittal letter, with the condition it satisfies, and submitted as attachments to the annual compliance report;
4. A cumulative listing of all post-certification changes by the Energy Commission or changes to the BLM ROW grant or approved POD by BLM , or cleared by BLM's AO and the CPM;
5. An explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. A listing of filings submitted to, or permits issued by, other governmental agencies during the year;
7. A projection of project compliance activities scheduled during the next year;
8. A listing of the year's additions to the on-site compliance file;
9. An evaluation of the on-site contingency plan for unplanned facility closure, including any suggestions necessary for bringing the plan up to date [see Compliance Conditions for Facility Closure addressed later in this section]; and
10. A listing of complaints, notices of violation, official warnings, and citations received during the year, a description of the resolution of any resolved matters, and the status of any unresolved matters.

CONFIDENTIAL INFORMATION (COMPLIANCE-9)

Any information that the project owner deems confidential shall be submitted to the Energy Commission's executive director with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information that is determined to be confidential shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

Any information the ROW holder deems confidential shall be submitted to the BLM AO with a written request for said confidentiality along with a justification for the request in accordance with 43 CFR 2804.13. All confidential submissions to BLM should be clearly stamped "proprietary information" by the holder when submitted.

ANNUAL ENERGY FACILITY COMPLIANCE FEE (COMPLIANCE-10)

Pursuant to the provisions of Section 25806(b) of the Public Resources Code, the project owner is required to pay an annual compliance fee, which is adjusted annually. Current compliance fee information is available on the Energy Commission's website

http://www.energy.ca.gov/siting/filing_fees.html. You may also contact the CPM for the current fee information. The initial payment is due on the date the Energy Commission adopts the final decision. All subsequent payments are due by July 1 of each year in which the facility retains its certification. The payment instrument shall be made payable to the California Energy Commission and mailed to: Accounting Office MS-02, California Energy Commission, 1516 9th St., Sacramento, CA 95814.

REPORTING OF COMPLAINTS, NOTICES, AND CITATIONS (COMPLIANCE-11)

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering with date and time stamp recording. All recorded complaints shall be responded to within 24 hours. The telephone number shall be posted at the project site and made easily visible to passersby during construction and operation. The telephone number shall be provided to BLM's AO and the CPM who will post it on the Energy Commission's web page at:

http://www.energy.ca.gov/sitingcases/power_plants_contacts.html.

Any changes to the telephone number shall be submitted immediately to BLM's AO and the CPM, who will update the web page.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies to BLM's AO and the CPM of all complaint forms, including noise and lighting complaints, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on the complaint form (Attachment A).

E.7 FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to implement the Closure, Revegetation and Restoration Plan to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made that provide the flexibility to deal with the specific situation and project setting that exist at the time of closure. Laws, ordinances, regulations and standards (LORS) pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure. Closure would be conducted in accordance with Condition of Certification **BIO-14** that requires the project owner to develop and implement a Closure, Revegetation and Rehabilitation Plan.

There are at least three circumstances in which a facility closure can take place: planned closure, unplanned temporary closure and unplanned permanent closure.

CLOSURE AND DECOMMISSIONING DEFINITIONS

Planned Closure

A planned closure occurs when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

Unplanned Temporary Closure

An unplanned temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster or an emergency. Short-term is defined as cessation of construction activities or operations of a power plant for a period less than 6-months long. Cessation of construction or operations for a period longer than 6 months is considered a permanent closure.

Unplanned Permanent Closure

An unplanned permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unplanned closure where the owner implements the on-site contingency plan. It can also include unplanned closure where the project owner fails to implement the contingency plan, and the project is essentially abandoned.

E.8 COMPLIANCE CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE (COMPLIANCE-12)

In order to ensure that a planned facility closure does not create adverse impacts, a closure process that provides for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a revision or update to the approved Closure, Revegetation and Rehabilitation Plan to BLM and the Energy Commission for review and approval at least 12 months (or other period of time agreed to by BLM's AO and the CPM) prior to commencement of closure activities. The project owner shall file 50 copies and 50 CDs with the Energy Commission and 10 copies and 10 CDs with BLM (or other number of copies agreed upon by BLM's AO and the CPM) of a proposed facility closure plan/Closure, Revegetation and Rehabilitation Plan.

The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related materials that must be removed from the site;
2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
3. address conformance of the plan with all applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of facility closure, and applicable conditions of certification; and.

4. Address any changes to the site revegetation, rehabilitation, monitoring and long-term maintenance specified in the existing plan that are needed for site revegetation and rehabilitation to be successful.

Prior to submittal of an amended or revised Closure, Revegetation and Restoration Plan, a meeting shall be held between the project owner, BLM's AO and the Energy Commission CPM for the purpose of discussing the specific contents of the plan.

In the event that there are significant issues associated with the proposed facility Closure, Revegetation and Restoration plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, BLM's AO the CPM shall hold one or more workshops and/or BLM and the Energy Commission may hold public hearings as part of its approval procedure.

As necessary, prior to or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety and the environment, but shall not commence any other closure activities until BLM and the Energy Commission approve the facility Closure, Revegetation and Restoration plan.

UNPLANNED TEMPORARY CLOSURE/ON-SITE CONTINGENCY PLAN (COMPLIANCE-13)

In order to ensure that public health and safety and the environment are protected in the event of an unplanned temporary facility closure, it is essential to have an On-Site Contingency Plan in place. The On-Site Contingency Plan will help to ensure that all necessary steps to mitigate public health and safety impacts and environmental impacts are taken in a timely manner.

The project owner shall submit an On-Site Contingency Plan for BLM's AO and CPM review and approval. The plan shall be submitted no less than 60 days (or other time agreed to by BLM's AO and the CPM) after approval of any NTP or letter granting approval to commence construction for each phase of construction. A copy of the approved plan must be in place during commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with BLM's AO and the CPM, will update the On-Site Contingency Plan as necessary. BLM's AO and the CPM may require revisions to the On-Site Contingency Plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the On-Site Contingency Plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by BLM's AO and the CPM.

The On-Site Contingency Plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days, unless other arrangements are agreed to by BLM's AO and the CPM, the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment. (Also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management.)

In addition, consistent with requirements under unplanned permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the On-Site Contingency Plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unplanned temporary closure, the project owner shall notify BLM's AO and the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the On-Site Contingency Plan. The project owner shall keep BLM's AO and the CPM informed of the circumstances and expected duration of the closure.

If BLM's AO and the CPM determine that an unplanned temporary closure is likely to be permanent, or for a duration of more than six months, a Closure Plan consistent with the requirements for a planned closure shall be developed and submitted to BLM's AO and the CPM within 90 days of BLM's AO and the CPM's determination (or other period of time agreed to by BLM's AO and the CPM).

UNPLANNED PERMANENT CLOSURE/ON-SITE CONTINGENCY PLAN (COMPLIANCE-14)

The On-Site Contingency Plan required for unplanned temporary closure shall also cover unplanned permanent facility closure. All of the requirements specified for unplanned temporary closure shall also apply to unplanned permanent closure. In addition, the On-Site Contingency Plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the event of abandonment.

In the event of an unplanned permanent closure, the project owner shall notify BLM's AO and the CPM, as well as other responsible agencies, by telephone, fax, or e-mail, within 24 hours and shall take all necessary steps to implement the On-Site Contingency Plan. The project owner shall keep BLM's AO and the CPM informed of the status of all closure activities.

To ensure that public health and safety and the environment are protected in the event of an unplanned permanent closure, the project owner shall submit an On-Site Contingency Plan no less than 60 days after a NTP is issued for each phase of development.

POST CERTIFICATION CHANGES TO BLM'S ROW GRANT AND/OR THE ENERGY COMMISSION DECISION: AMENDMENTS, OWNERSHIP CHANGES, STAFF APPROVED PROJECT MODIFICATIONS AND VERIFICATION CHANGES (COMPLIANCE-15)

The project owner must petition the Energy Commission pursuant to Title 20, California Code of Regulations, section 1769, in order to modify the project (including linear facilities) design, operation or performance requirements, and to transfer ownership or operational control of the facility. The BLM ROW holder must file a written request in the form of an application to the BLM AO in order to change the terms and conditions of their ROW grant or POD. Written requests will be in a manner prescribed by the BLM

AO. Implementation of a project modification without first securing BLM approval may result in financial and other liabilities in accordance with 43 CFR 2808.

It is the responsibility of the project owner to contact BLM's AO and the CPM to determine if a proposed project change should be considered a project modification pursuant to section 1769. Implementation of a project modification without first securing Energy Commission staff approval, may result in enforcement action that could result in civil penalties in accordance with section 25534 of the Public Resources Code.

A petition is required for amendments and for staff approved project modifications as specified below. Both shall be filed as a "Petition to Amend." Staff will determine if the change is significant or insignificant. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to BLM's AO and the CPM, who will file it with the Energy Commission's Dockets Unit in accordance with Title 20, California Code of Regulations, section 1209.

The criteria that determine which type of approval and the process that applies are explained below. They reflect the provisions of Section 1769 at the time this condition was drafted. If the Commission's rules regarding amendments are amended, the rules in effect at the time an amendment is requested shall apply.

Amendment

The project owner shall petition the Energy Commission, pursuant to Title 20, California Code of Regulations, Section 1769(a), when proposing modifications to the project (including linear facilities) design, operation, or performance requirements. If a proposed modification results in deletion or change of a condition of certification, or makes changes that would cause the project not to comply with any applicable laws, ordinances, regulations or standards, the petition will be processed as a formal amendment to the Energy Commission's final decision, which requires public notice and review of the BLM-Energy Commission staff analysis, and approval by the full Energy Commission. The petition shall be in the form of a legal brief and fulfill the requirements of Section 1769(a). Upon request, the CPM will provide you with a sample petition to use as a template.

The ROW holder shall file an application to amend the BLM ROW grant for any substantial deviation or change in use in accordance with the regulations at 43 CFR 2807.20. The requirements to amend a ROW grant are the same as when filing a new application including paying processing and monitoring fees and rent.

Staff Approved Project Modification

Modifications that do not result in deletions or changes to conditions of certification, and that are compliant with laws, ordinances, regulations and standards, may be authorized by BLM's AO and the CPM as a staff approved project modification (SAPM) pursuant to section 1769(a)(2). Once staff files an intention to approve the proposed project modifications, any person may file an objection to staff's determination within 14 days of service on the grounds that the modification does not meet the criteria of section 1769 (a)(2). If a person objects to staff's determination, the petition must be processed as a formal amendment to the decision and must be approved by the full commission at a

noticed business meeting or hearing. BLM and the Energy Commission intend to integrate a process to jointly approve SAPMs to avoid duplication of approval processes and ensure appropriate documentation for the public record.

Change of Ownership

Change of ownership or operational control also requires that the project owner file a petition pursuant to section 1769(b). This process requires public notice and approval by the full Commission and BLM. The petition shall be in the form of a legal brief and fulfill the requirements of Section 1769(b). Upon request, the CPM will provide you with a sample petition to use as a template. The transfer of ownership of a BLM ROW grant must be through the filing of an application for assignment of the grant in accordance with 43 CFR 2807.21.

Verification Change

A verification may be modified by BLM's AO and the CPM without requesting an amendment to the ROW Grant or Energy Commission decision if the change does not require modifying any conditions of certification and provides an effective alternate means of verification.

E.9 CBO DELEGATION AND AGENCY COOPERATION

In performing construction and operation monitoring of the project, BLM and Energy Commission staff act as, and have the authority of, the Chief Building Official (CBO). BLM and Energy Commission staff may delegate CBO responsibility to either an independent third party contractor or the local building official. BLM and the Energy Commission intend to avoid duplication by integrating the responsibilities of the CBO with those of a BLM compliance inspector and will work jointly in the selection of a CBO. BLM and Energy Commission staff retain CBO authority when selecting a delegate CBO, including enforcing and interpreting federal, state and local codes, and use of discretion, as necessary, in implementing the various codes and standards.

BLM and Energy Commission staff may also seek the cooperation of state, regional and local agencies that have an interest in environmental protection when conducting project monitoring.

E.10 ENFORCEMENT

BLM's legal authority to enforce the terms and conditions of its ROW Grant is specified in 43 CFR 2807.16 through 2807.19. BLM may issue an immediate temporary suspension of activities if they determine a holder has violated one or more of the terms, conditions, or stipulations of the grant. BLM may also suspend or terminate a ROW grant if a holder does not comply with applicable laws and regulation or any terms, conditions, or special stipulations contained in the grant. Prior to suspending or terminating a ROW grant, BLM will provide written notice to the holder stating it intends to suspend or terminate and will provide reasonable opportunity to correct any noncompliance.

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Energy Commission Decision. The specific action and amount of any fines the Energy Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, oversight, unforeseeable events, and other factors the Energy Commission may consider.

ENERGY COMMISSION NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1237, but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current state law and regulations, are described below. They shall be followed unless superseded by future law or regulations.

Informal Dispute Resolution Process

The following procedure is designed to informally resolve disputes concerning the interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate an informal dispute resolution process. Disputes may pertain to actions or decisions made by any party, including the Energy Commission's delegate agents.

This process may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1237, but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The process encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be brought before the full Energy Commission for consideration via the complaint and investigation procedure.

Request for Informal Investigation

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner, BLM's

and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter. Within seven working days of the CPM's request, the project owner shall provide a written report to the CPM and BLM's AO of the results of the investigation, including corrective measures proposed or undertaken. Depending on the urgency of the noncompliance matter, the CPM and BLM's AO may conduct a site visit and/or request the project owner to also provide an initial verbal report, within 48 hours.

Request for Informal Meeting

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures proposed or undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within 14 days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
2. secure the attendance of appropriate Energy Commission staff and staff of any other agencies with expertise in the subject area of concern, as necessary;
3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner;
4. promptly prepare and distribute copies to all in attendance, to the BLM's AO and to the project file, after the conclusion of such a meeting, a summary memorandum that fairly and accurately identifies the positions of all parties and any understandings reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et seq.

Formal Dispute Resolution Procedure-Complaints and Investigations

Any person may file a complaint with the Energy Commission's Dockets Unit alleging noncompliance with a Commission decision adopted pursuant to Public Resources Code section 25500. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1237.

KEY EVENTS LIST

PROJECT: _____

DOCKET #: _____

COMPLIANCE PROJECT MANAGER: _____

BLM AUTHORIZED OFFICER: _____

| EVENT DESCRIPTION | DATE |
|---|------|
| Certification Date | |
| Obtain Site Control | |
| Online Date | |
| POWER PLANT SITE ACTIVITIES | |
| Start Site Mobilization | |
| Start Ground Disturbance | |
| Start Grading | |
| Start Construction | |
| Begin Pouring Major Foundation Concrete | |
| Begin Installation of Major Equipment | |
| Completion of Installation of Major Equipment | |
| First Combustion of Gas Turbine | |
| Obtain Building Occupation Permit | |
| Start Commercial Operation | |
| Complete All Construction | |
| TRANSMISSION LINE ACTIVITIES | |
| Start T/L Construction | |
| Synchronization with Grid and Interconnection | |
| Complete T/L Construction | |
| FUEL SUPPLY LINE ACTIVITIES | |
| Start Gas Pipeline Construction and Interconnection | |
| Complete Gas Pipeline Construction | |
| WATER SUPPLY LINE ACTIVITIES | |
| Start Water Supply Line Construction | |
| Complete Water Supply Line Construction | |

| COMPLIANCE TABLE 1 SUMMARY of COMPLIANCE CONDITIONS OF CERTIFICATION | | |
|---|--|--|
| CONDITION NUMBER | SUBJECT | DESCRIPTION |
| COMPLIANCE-1 | Unrestricted Access | The project owner shall grant BLM and Energy Commission staff, delegate agencies or consultants unrestricted access to the power plant site. |
| COMPLIANCE-2 | Compliance Record | The project owner shall maintain project files on-site. BLM and Energy Commission staff and delegate agencies shall be given unrestricted access to the files. |
| COMPLIANCE-3 | Compliance Verification Submittals | The project owner is responsible for the delivery and content of all verification submittals to BLM's Authorized Officer and the CPM, whether such condition was satisfied by work performed or the project owner or his agent. |
| COMPLIANCE-4 | Pre-construction Matrix and Tasks Prior to Start of Construction | <p>Construction shall not commence until the all of the following activities/submittals have been completed:</p> <ul style="list-style-type: none"> • property owners living within one mile of the project have been notified of a telephone number to contact for questions, complaints or concerns, • a pre-construction matrix has been submitted identifying only those conditions that must be fulfilled before the start of construction, • all pre-construction conditions have been complied with, • BLM's Authorized Officer and the CPM have issued a letter to the project owner authorizing construction. |
| COMPLIANCE-5 | Posting of A Surety Bond | The project owner shall post a surety bond adequate to cover the cost of decommissioning and restoration including the removal of the project features that have been constructed for that that portion of the site and restoring the native topography and vegetation. |
| COMPLIANCE-6 | Compliance Matrix | The project owner shall submit a compliance matrix (in a spreadsheet format) with each monthly and annual compliance report which includes the status of all compliance conditions of certification. |
| COMPLIANCE-7 | Monthly Compliance Report including a Key Events List | During construction, the project owner shall submit monthly compliance reports (MCRs) which include specific information. The first MCR is due the month following the Energy Commission business meeting date on which the project was approved and shall include an initial list of dates for each of the events identified on the Key Events List. |

| | | |
|---------------|---|---|
| COMPLIANCE-8 | Annual Compliance Reports | After construction ends and throughout the life of the project, the project owner shall submit annual compliance reports instead of monthly compliance reports. |
| COMPLIANCE-9 | Confidential Information | Any information the project owner deems confidential shall be submitted to BLM's AO and the Energy Commission's executive director with a request for confidentiality. |
| COMPLIANCE-10 | Annual fees | Payment of Annual Energy Facility Compliance Fee to the Energy Commission; |
| COMPLIANCE-11 | Reporting of Complaints, Notices and Citations | Within 10 days of receipt, the project owner shall report to BLM's Authorized Officer and the CPM, all notices, complaints, and citations. |
| COMPLIANCE-12 | Planned Facility Closure | The project owner shall submit any revisions or changes to the Closure, Revegetation and Restoration Plan to BLM's Authorized Officer and the CPM at least 12 months prior to commencement of a planned closure. |
| COMPLIANCE-13 | Unplanned Temporary Facility Closure | To ensure that public health and safety and the environment are protected in the event of an unplanned temporary closure, the project owner shall submit an On-Site Contingency Plan no less than 60 days after a NTP is issued for each power plant. |
| COMPLIANCE-14 | Unplanned Permanent Facility Closure | To ensure that public health and safety and the environment are protected in the event of an unplanned permanent closure, the project owner shall submit an On-Site Contingency Plan no less than 60 days after a NTP is issued for each power plant. |
| COMPLIANCE-15 | Post-certification changes to the ROW Grant and/or Decision | The project owner must petition the Energy Commission and file an application to amend the ROW grant to delete or change a condition of certification, modify the project design or operational requirements and/or transfer ownership of or operational control of the facility. |

**ATTACHMENT 1
COMPLAINT REPORT / RESOLUTION FORM**

Complaint Log Number: _____ Docket Number: _____

Project Name: _____

COMPLAINANT INFORMATION

Name: _____ Phone Number: _____

Address: _____

COMPLAINT

DATE COMPLAINT RECEIVED: _____ TIME COMPLAINT RECEIVED: _____

COMPLAINT RECEIVED BY: _____ ☐ TELEPHONE ☐ IN WRITING (COPY ATTACHED)

DATE OF FIRST OCCURRENCE: _____

DESCRIPTION OF COMPLAINT (INCLUDING DATES, FREQUENCY, AND DURATION): _____

FINDINGS OF INVESTIGATION BY PLANT PERSONNEL: _____

DOES COMPLAINT RELATE TO VIOLATION OF BLM ROW GRANT? ☐ YES ☐ NO

DOES COMPLAINT RELATE TO VIOLATION OF A CEC REQUIREMENT? ☐ YES ☐ NO

DATE COMPLAINANT CONTACTED TO DISCUSS FINDINGS: _____

DESCRIPTION OF CORECTIVE MEASURES TAKEN OR OTHER COMPLAINT RESOLUTION: _____

DOES COMPLAINANT AGREE WITH PROPOSED RESOLUTION? ☐ YES ☐ NO

IF NOT, EXPLAIN: _____

CORRECTIVE ACTION

IF CORRECTIVE ACTION NECESSARY, DATE COMPLETED: _____

DATE FIRST LETTER SENT TO COMPLAINANT (COPY ATTACHED): _____

DATE FINAL LETTER SENT TO COMPLAINANT (COPY ATTACHED): _____

OTHER RELEVANT INFORMATION: _____

"This information is certified to be correct."

PLANT MANAGER SIGNATURE: _____ DATE: _____

(ATTACH ADDITIONAL PAGES AND ALL SUPPORTING DOCUMENTATION, AS REQUIRED)

F. LIST OF PREPARERS

GENESIS SOLAR ENERGY PROJECT

LIST OF PREPARERS

| | |
|---|---|
| Executive Summary | Mike Monasmith |
| Introduction | Mike Monasmith |
| Proposed Project and Alternatives | Mike Monasmith, Susan V. Lee |
| Cumulative Scenario | Susan V. Lee |
| Air Quality | Joseph Hughes and William Walters, P.E. |
| Biological Resources | Carolyn Chainey-Davis, Amy Golden, Sara Keller, Mark Massar, Susan Sanders |
| Cultural Resources and Native American Values | Beth Bagwell, George Kline |
| Hazardous Materials Management | Alvin Greenberg, Ph.D. |
| Health and Safety | Alvin Greenberg, Ph.D. |
| Land Use, Recreation, and Wilderness | Negar Vahidi |
| Noise and Vibration | Erin Bright |
| Socioeconomics and Environmental Justice | Scott Debauche |
| Soils and Water Resources | Michael Daly, Michael Donovan, John Thornton |
| Traffic and Transportation | Candace Hills, William Walters, P.E. |
| Transmission Line Safety and Nuisance | Obed Odoemelam, Ph.D. |
| Visual Resources | James Jewel, William Walters, William Kanemoto |
| Waste Management | James Thurber |
| Worker Safety and Fire Protection | Alvin Greenberg, Ph.D. |
| Facility Design | Shahab Koshmashrab |
| Geology, Paleontology and Minerals | Dal Hunter, Ph.D., CEG. |
| Power Plant Efficiency | Shahab Koshmashrab |
| Power Plant Reliability | Shahab Koshmashrab |
| Transmission System Engineering | Mark Hesters, Sudath Edirisuriya |
| General Conditions | Mary Dyas |
| Project Assistant | Maria Santourdjian |

**G. WITNESS
QUALIFICATIONS AND
DECLARATIONS**

DECLARATION OF

Mike Monasmith

I, Mike Monasmith, declare as follows:

1. I am presently employed by the California Energy Commission in the Siting, Transmission and Environmental Protection Division as a Senior Project Manager.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared the staff testimony for the **Executive Summary and Project Description** for the Genesis Solar Energy Project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____ Signed: _____

At: Sacramento, California

J. MIKE MONASMITH

6951 Pocket Road
Sacramento, CA 95831
916-412-8589

OVERVIEW:

Eighteen years of experience in project management and planning, public and governmental affairs, media relations, community outreach and issue advocacy for energy, water, agriculture, forestry and telecommunications for public and private concerns at the local, state and federal level.

WORK HISTORY:

CALIFORNIA ENERGY COMMISSION, Sacramento
Siting, Transmission & Environmental Protection Division

Senior Project Manager (2009-present) --

Project Manager (2007-2009) --

CALIFORNIA ENERGY COMMISSION, Sacramento
Public Adviser's Office

Associate Public Adviser (2003 - 2007) --

CALIFORNIA RESOURCES AGENCY, Sacramento

Special Assistant, Secretary Mary D. Nichols (2003) --

CALIFORNIA DEMOCRATIC PARTY, Los Angeles

Director of Communications (2002) --

Coordinated Campaign, Gore/Lieberman Deputy Director (2000) --

Press Secretary, Coordinated Campaign, Californians for Feinstein (1994) --

U.S. CONGRESSWOMAN JANE HARMAN, Washington DC

Chief of Staff (1997 - 1998) --

Deputy Campaign Manager, Harman for Governor (1998) --

Political Director (2001) --

STATE CONTROLLER KATHLEEN CONNELL, Los Angeles

Chief Deputy Controller (2000 - 2001) --

Assistant Deputy Controller, External Affairs (1995 - 1996) --

VERIZON COMMUNICATIONS, Thousand Oaks, CA

Director, Los Angeles Government Affairs (1999 - 2000) --

U.S. DEPARTMENT OF THE INTERIOR, Washington DC

Special Assistant, Assistant Secretary Patricia Beneke, (1997) --

McCOY & ASSOCIATES, Los Angeles

LA Convention 2000 (1999) – Host Committee, 2002 Democratic National Convention

Interim Communications Director

“Yes on Proposition 1” (1999) – \$1.2 Billion Public Safety Bond for the City of Los Angeles

Campaign Manager

DWP Festival of Lights (1998) – Griffin Park Holiday Lights event

Project Manager

“Yes on Proposition DD” (1998) – \$700 Million Library Bond for the City of Los Angeles

Campaign Manager

CLINTON/GORE ‘96 GENERAL COMMITTEE, Los Angeles

California Deputy State Director (Southern California Political Lead) (1996)

California Desk Co-Director, Presidential Inaugural Committee (1997)

SHEILA JAMES KUEHL FOR ASSEMBLY, Los Angeles

Campaign Manager (1994)

LOS ANGELES MAYOR RICHARD RIORDAN, Los Angeles

Deputy Press Secretary / Mayoral Assistant / Advance Co-Lead (1993-94)

Deputy Field Director / Deputy Director, Advance (Riordan for Mayor) 1993)

DEMOCRATIC PARTY OF ORANGE COUNTY, Santa Ana

Office Manager / Chief Assistant, Chairman Adler (1991-92)

UNIVERSITY OF CALIFORNIA, Santa Cruz

Federal Work-study Program Manager, UCSC Student Employment (1990 – 1991)

ICICLE SEAFOODS, Inc., Seward, AK

Production Supervisor, Towa Eggroom (Summers, 1988-1991)

EDUCATION:

University of California at Santa Cruz (College VIII)

B.A., Environmental Studies/Politics (Policy & Planning), 1990

(Thesis Honors: Resource Management, Tongass National Forest, Alaska)

DECLARATION OF

Susan V. Lee

I, Susan V. Lee, declare as follows:

1. I am presently employed by Aspen Environmental Group, consultant to the California Energy Commission's Facilities Siting Office of the Systems Assessments and Facilities Siting Division as a Senior Associate/Vice President.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared the staff testimony on Alternatives for the Genesis Solar Energy Project based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: February 19, 2010

Signed: 

At: San Francisco, California



SUSAN V. LEE

Vice President, San Francisco Operations

ACADEMIC BACKGROUND

M.S., Applied Earth Science, Stanford University, 1984

B.A., Geology, Oberlin College, 1977

PROFESSIONAL EXPERIENCE

Ms. Lee has over 25 years of technical and managerial experience in environmental assessment, and she currently manages Aspen's San Francisco Office. Her expertise is in management of environmental assessment for infrastructure and energy projects (renewable energy projects, electric transmission lines, pipelines, and gas-fired power plants) under both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). Ms. Lee has managed preparation of several major controversial transmission line and pipeline siting EIR/EISs, including the Sunrise Powerlink, Path 15, Jefferson-Martin, Tri-Valley, and Devers-Palo Verde No. 2. Prior to employment at Aspen, Ms. Lee worked for 10 years with the Federal government [the U.S. Minerals Management Service (MMS) and the U.S. Geological Survey (USGS)].

Ms. Lee has worked for Aspen Environmental Group since 1993. She has contributed to both technical and project management aspects of Aspen's environmental projects, including the following:

- **California Energy Commission.** Ms. Lee has supported CEC staff since the fall of 2000. To date, she has prepared analyses for 14 power plants throughout the State, and she has also contributed to several special project reports. She has participated in numerous public workshops and hearings around the state, and completed the CEC's Expert Witness Training. Her major efforts for the CEC include the following:
 - Ms. Lee is managing the Alternatives and Cumulative impact analyses for several solar thermal projects on public lands, coordinating NEPA issues with BLM staff and CEQA issues with the Energy Commission's Project Manager.
 - Ms. Lee managed preparation of the CEC's first comprehensive dry cooling analysis for a coastal power plant using once-through cooling, the **Morro Bay Power Plant Modernization Project**. She managed a team of authors who developed a preliminary cooling design, and provided impact analysis.
 - Ms. Lee has prepared staff assessment **Alternatives Analyses** (consistent with CEQA and the CEC's procedures) for the CEC's staff reports considering proposed new or re-powered power plants at South Bay (San Diego), Blythe (BEP II), Morro Bay, El Segundo, Avenal, San Joaquin Valley, Potrero Unit 7 (San Francisco), Tracy, East Altamont, Henrietta, and the San Francisco Electric Reliability Project. She also prepared the alternatives analysis for the CEC's Blythe Transmission Modifications Project. In addition to preparing staff assessment sections documenting comparative impacts of alternatives, this work includes making presentations at PSA Workshops and testifying at Evidentiary Hearings.
 - Ms. Lee managed a three-year transmission corridor modeling project, **Planning Alternative Corridors for Transmission (PACT)**, in conjunction with the CEC PIER Environmental Program. The model uses Geographic Information Systems and decision modeling to assist in comparing potential alternative transmission corridors. Aspen's work included overall contract management, as well as development and management of a Project Steering Committee and six Technical Advisory Groups.
 - Ms. Lee prepared a detailed Background Report and made a presentation at an Energy Commission workshop on "**Comparative Alternatives to Transmission**" as part of the Integrated Energy Policy Report (IEPR) 2004 Update process. This project evaluated non-wires alternatives to transmission lines;

ongoing work is related to development of a methodology for consideration of these alternatives as part of the transmission planning process.

- Ms. Lee served as the CEC's **Project Manager** for the Small Power Plant Exemption (SPPE) environmental review process for the Woodland Generation Station 2, an 80-megawatt power plant proposed by the Modesto Irrigation District.
- Ms. Lee managed preparation of **Power Plant Cooling Options Reports** for the Potrero Unit 7 Project, Morro Bay, SMUD Cosumnes, and El Segundo power plants. These analyses include conceptual design of dry cooling systems, hybrid cooling systems, and water supply options including use of reclaimed water in both once through and hybrid cooling systems.
- Ms. Lee has provided management and technical support to Aspen's preparation of several reports for the CEC: the Environmental Performance Report, the Coastal Power Plant Study, and the Alternative Generation Technology study.
- **California Valley Solar Ranch EIR.** Under contract to San Luis Obispo County, Ms. Lee is managing preparation of an EIR to evaluate development of a 250 MW solar photovoltaic power facility on nearly 4,000 acres in the Carrizo Plain.
- **SDG&E Sunrise Powerlink Transmission Project EIR/EIS.** Under a \$14 million contract to the CPUC, and under a Memorandum of Understanding with the Bureau of Land Management (BLM), Ms. Lee managed preparation of an EIR/EIS for a highly controversial 150-mile transmission line from Imperial County to coastal San Diego County.
- **SCE Devers-Palo Verde No. 2 Transmission Line Project EIR/EIS.** Under contract to the CPUC, Ms. Lee managed preparation of an EIR/EIS to evaluate the impacts of a constructing a 230-mile 500 kV transmission line between the Palo Verde generating hub in Arizona and SCE's Devers Substation.
- **Long-Term Procurement Planning and Barriers to Renewable Power Implementation.** For the CPUC, Ms. Lee and a team of environmental and economic specialists developed environmental and economic data and developed timelines of permitting and barriers to implementing the proposed 33 percent Renewable Portfolio Standard, including ranking and screening of available energy resources.
- **Jefferson-Martin 230 kV Transmission Line Project.** Ms. Lee managed preparation of an EIR for PG&E's proposed 27-mile transmission line through scenic San Mateo County in the Highway 280 corridor, urban Colma and Daly City, and across San Bruno Mountain for the California Public Utilities Commission (CPUC).
- **PG&E Northeast San Jose Transmission Reinforcement Project:** Ms. Lee served as the Project Manager for this CPUC contract to evaluate PG&E's proposed transmission improvements in Santa Clara and Alameda Counties.
- **PG&E Tri-Valley 2002 Capacity Increase Project.** Ms. Lee managed preparation of the Draft and Final EIRs for this controversial and complex project during 2000 and 2001, which was certified by the CPUC in May 2001. The Draft EIR (over 800 pages) evaluated proposed transmission lines and substations in the Tri-Valley area (Cities of Pleasanton, Dublin, Livermore, and San Ramon) of Alameda and Contra Costa Counties, and responded to a high level of local concern regarding electric and magnetic fields (EMFs).

DECLARATION OF

I, Joseph Hughes declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities Siting Office of the Systems Assessments and Facilities Siting Division as an Air Resources Engineer.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony and errata on **Air Quality** for the **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony and errata is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and errata and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 23, 2010 Signed: Joseph Hughes

At: Sacramento, California

Education

Sacramento State University 2003-2008

Sacramento, Ca

Bachelor of Science, Mechanical Engineering Technology, 3.25GPA-May 2008

AA degree in liberal arts and science 3.0 GPA

Experience

California Energy Commission March 2009-Present

Sacramento, Ca

Air Resources Engineer

- Currently co-authoring air quality staff assessments for thermal power plant projects in California producing more than 50 megawatts of electricity.
- Currently working on American Recovery and Reinvestment Act (ARRA) projects, along with natural gas fired projects.
- Review and process compliance reports for multiple power plants in California.
- Currently working on project amendments and modifications requiring air quality analysis.
- Trained in CEQA and NEPA analysis, along with AERMOD air modeling.

Capital Engineering Consultants, Inc April 2008-2009

Sacramento, Ca

Mechanical Engineer

- Responsible for detailed and accurate take off calculations to ensure successful project completion.
- Completing engineering design for Heating Ventilation Air Conditioning and Plumbing by utilizing complex engineering calculations and software.
- Responsible for meeting code regulation and requirements to the degree acceptable by various organizations.
- Lead productive weekly team meetings to discuss project scheduling, cost effectiveness, request for information, and change orders.

DECLARATION OF
Testimony of William Walters, P.E.

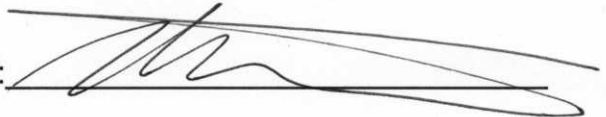
I, **William Walters**, declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission's Siting, Transmission and Environmental Protection Division, as a senior associate in engineering and physical sciences.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Air Quality/Greenhouse Gases**, and prepared the **Visual Resources VR-2 Appendix** for the **Genesis Solar Energy Project** (09-AFC-8) based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 23, 2010

Signed: _____



At: Agoura Hills, California

WILLIAM WALTERS, P.E.
Air Quality Specialist

ACADEMIC BACKGROUND

B.S., Chemical Engineering, 1985, Cornell University

PROFESSIONAL EXPERIENCE

Mr. Walters has over 20 years of technical and project management experience in environmental compliance work, including environmental impact reports, emissions inventories, source permitting, energy and pollution control research RCRA/CERCLA site assessment and closure, site inspection, and source monitoring.

Aspen Environmental Group

2000 to present

Responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- **Engineering and Environmental Technical Assistance to Conduct Application for Certification Review for the California Energy Commission:**
 - Preparation and project management of the air quality section of the Staff Assessment and/or Initial Study and the visual plume assessment for the following California Energy Commission (CEC) licensing projects: Hanford Energy Park; United Golden Gate, Phase I; Huntington Beach Modernization Project (including Expert Witness Testimony); Woodland Generating Station 2; Ocotillo Energy Project, Phase I; Magnolia Power Project; Colusa Power Project; Inland Empire Energy Center; Rio Linda/Elverta Power Plant Project; Roseville Energy Center; Henrietta Peaker Project; Tracy Peaking Power Plant Project (including Expert Witness Testimony); Avenal Energy Project; San Joaquin Valley Energy Center (including expert witness testimony); Salton Sea Unit 6 Project (including expert witness testimony); Modesto Irrigation District Electric Generation Station (including expert witness testimony); Walnut Energy Center (including expert witness testimony); Riverside Energy Resource Center (including expert witness testimony); Pastoria Energy Facility Expansion; Panoche Energy Center; Starwood Power Plant; and Riverside Energy Resource Center Units 3 and 4 Project (in progress).
 - Preparation and project management of the visual plume assessment for the following California Energy Commission (Energy Commission) licensing projects: Metcalf Energy Center Power Project (including Expert Witness Testimony); Contra Costa Power Plant Project (including Expert Witness Testimony); Mountainview Power Project; Potrero Power Plant Project; El Segundo Modernization Project; Morro Bay Power Plant Project; Valero Cogeneration Project; East Altamont Energy Center (including expert witness testimony); Russell City Energy Center; SMUD Cosumnes Power Plant Project (including expert witness testimony); Pico Power Project; Blythe Energy Project Phase II; City of Vernon Malburg Generating Station; San Francisco Electric Reliability Project; Los Esteros Critical Energy Facility Phase II; Roseville Energy Park; City of Vernon Power Plant; South Bay Replacement Project; Walnut Creek Energy Park; Sun Valley Energy Project; Highgrove Power Plant; Colusa Generating Station; Russell City Energy Center; Avenal Energy Project; Carlsbad Energy Center; Community Power Project; Panoche Energy Center; San Gabriel Generating Station; Sentinel Energy Project; and Victorville 2 Hybrid Power Project.
 - Assistance in the aircraft safety review of thermal plume turbulence for the Riverside Energy Resources Center; Russell City Energy Center Amendment (including expert witness testimony); Eastshore Energy Power Plant (including expert witness testimony); Carlsbad Energy Center (in progress), Riverside Energy Resource Center Units 3 and 4 Project; Victorville 2 Hybrid Power Project; and the Blythe Energy Power

Plant and Blythe Energy Project Phase II (including expert witness testimony) siting cases. Assistance in the aircraft safety review of thermal and visual plumes of the operating Blythe Energy Power Plant. Preparation of a white paper on methods for the determination of vertical plume velocity determination for aircraft safety analyses.

- Preparation and instruction of a visual water vapor plume modeling methodology class for the CEC.
- Preparation and project management of the public health section of the Initial Study for the Woodland Generating Station 2 Energy Commission licensing project.
- Preparation of project amendment or project compliance assessments, for air quality or visual plume impacts, for several licensed power plants, including: Metcalf Energy Center; Pastoria Power Plant; Elk Hills Power Plant; Henrietta Peaker Project; Tracy Peaker Project; Magnolia Power Project; Delta Energy Center; SMUD Cosumnes Power Plant; Walnut Energy Center; San Joaquin Valley Energy Center; City of Vernon Malburg Generating Station; Otay Mesa Power Plant; Los Esteros Critical Energy Facility; Pico Power Project; Riverside Energy Resource Center; Blythe Energy Project Phase II; Inland Empire Energy Center; Salton Sea Unit 6 Project; and Starwood Power-Midway Peaking Power Plant.
- Preparation of the air quality section of the staff paper “A Preliminary Environmental Profile of California’s Imported Electricity” for the Energy Commission and presentation of the findings before the Commission.
- Preparation of the draft staff paper “Natural Gas Quality: Power Turbine Performance During Heat Content Surge”, and presentation of the preliminary findings at the California Air Resources Board Compressed Natural Gas Workshop and a SoCalGas Technical Advisory Committee meeting.
- Preparation of the staff paper “Emission Offsets Availability Issues” and preparation and presentation of the Emission Offsets Constraints Workshop Summary paper for the Energy Commission.
- Preparation of information request and data analysis to update the Energy Commission’s Cost of Generation Model capital and operating cost factors for combined and simple cycle gas turbine projects. Additionally, performed a review of the presentation for the revised model as part of the CEC’s 2007 Integrated Energy Policy Report workshops, and attended the workshop and answering Commissioner questions on the data collection and data analysis.
- For the **Los Angeles Department of Water and Power (LADWP)**:
 - Preparation of the Air Quality Inventory for the LADWP River Supply Pipeline Project EIR.
 - Project management and preparation of the Air Quality Section for the LADWP Valley Generating Station Stack Removal IS/MND support project.
- For the **U.S. Army Corps of Engineers (Corps)**:
 - Preparation of the Air Quality Section and General Conformity Analysis for the Matilija Dam Ecosystem Restoration Project EIS/R for the Corps.
 - Preparation of emission inventory and General Conformity Analysis of the Murrieta Creek Flood Control Project and the Joint Red Flag exercise to be conducted in the Nevada Test and Training Range.
 - Emission inventory for the construction activities forecast for the San Jose/Old San Jose Creeks Ecosystem Restoration project for the Corps.
- Other Projects:
 - Preparation of the Air Quality Section of the LAUSD New School Construction Program EIR and provided traffic trip and VMT calculation support for the Traffic and Transportation Section.

- Preparation of the draft staff paper “Natural Gas Quality: Power Turbine Performance During Heat Content Surge”, and presentation of the preliminary findings at the California Air Resources Board Compressed Natural Gas Workshop and a SoCalGas Technical Advisory Committee meeting.
- Preparation of the Air Quality Section of the Environmental Information Document in support of the Coastal Consistency Determinations for the suspension of operation requests for undeveloped units and leases off the Central California Coast.
- Preparation of comments on the Air Quality, Alternatives, Marine Traffic, Public Safety, and Noise section of the Cabrillo Port Liquefied Natural Gas Deepwater Port Draft EIS/EIR for the City of Oxnard.
- Preparation of the emission estimates used in the Air Quality Sections for the DWR Tehachapi Second Afterbay Project Initial Study and EIR.

Camp Dresser & McKee, Inc.

1998 to 2000

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Preparation of emission inventories and dispersion modeling for criteria and air toxic pollutants for the Los Angeles International Airport Master Plan (LAXMP) EIS/EIR.
- Project Manager/Technical lead for the completion of air permit applications and air compliance audits for two Desa International fireplace accessory manufacturing facilities located in Santa Ana, California.
- Project manager/technical lead for the completion of Risk Management Plans (RMPs) for four J.R. Simplot food processing facilities in Oregon, Idaho, and Washington and the Consolidated Reprographics facility located in Irvine, California.

Planning Consultants Research

1997 to 1998

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Project Manager for a stationary source emission audit of the entire Los Angeles International Airport complex for Los Angeles World Airports (LAWA) in support of the LAXMP.
- Review of the Emission Dispersion Modeling System (EDMS) and preparation of a report with findings to the Federal Aviation Administration for LAWA in support of the LAXMP.
- Project manager for the ambient air monitoring and deposition monitoring studies performed for LAWA in support of the LAXMP, including the selection of the monitoring sites and specialty subcontractor, and review of all monitoring data.

Aspen Environmental Group/Clean Air Solutions

1995 to 1996

Mr. Walters was responsible as lead technical and/or project manager of environmental projects. Specific responsibilities and projects include the following:

- Manager of the Portland, Oregon, office of Clean Air Solutions from March 1995 to December 1995, with responsibilities including Project Management, Business Development, and Administration.
- Control technology assessment, engineering support and Notice of Intent to construct preparation for J.R. Simplot's Hermiston, Oregon, food processing facility. Review and revision of an Air Contaminant Discharge Permit application, Title V permit application, and PSD modeling analysis for J.R. Simplot's Hermiston facility.

- Air quality compliance report including an air emission inventory, regulation and permit compliance determination, and recommendations for compliance for Lumber Tech, Inc.'s Lebanon, Oregon, wood products facility.

Fluor Daniel, Inc.

1990 to 1995 and 1996 to 1997

Mr. Walters was responsible as lead technical or project manager for major environmental projects for both government and private clients. His projects included:

- Prepared several air permit applications for the ARCO Los Angeles Refinery Polypropylene Plant Project; Phase I environmental assessments for properties located in Southern California; and a site investigation and RCRA closure plan for a hazardous waste storage site in Vernon, California.
- Project manager of the Anaconda Smelter site for the U.S. Environmental Protection Agency's (EPA) Alternative Remedial Contract System (ARCS) project during the conclusion of technical activities and project closeout. Prepared a cost recovery report for the project.
- Performed environmental analysis for the Bonneville Power Authority, including air pollution BACT analysis, wastewater analysis, and evaluation of secondary environmental effects of electric power producing technologies.

Jacobs Engineering Group

1988 to 1990

Mr. Walters was responsible for a wide range of air pollution regulatory and testing projects, including the following:

- Project manager of air toxic emission inventory reports prepared for U.S. Borax's boron mining and refining facility and the Naval Aviation Depot (N. Island Naval Base, San Diego, California).
- Prepared air permit applications and regulatory correspondence for several facilities including the U.S. Department of Energy's Feed Material Production Center uranium processing facility in Fernald, Ohio; Evaluation of a sludge dewatering process at Unocal's Wilmington, California, Refinery; and United Airlines blade repair facility at the San Francisco Airport.
- Characterized and quantified air emissions for offshore oil and gas development activities associated with Federal oil and gas Lease Sale 95, offshore southern California, for the U.S. Minerals Management Service.

CERTIFICATIONS

- Chemical Engineer, California License 5973
- CARB, Fundamentals of Enforcement Seminar
- EPA Methods 1-8, 17; Training Seminar

AWARDS

- California Energy Commission Outstanding Performance Award 2001

DECLARATION OF Carolyn Chainey-Davis

I, **Carolyn Chainey-Davis**, declare as follows:

1. I am presently under contract with Aspen Environmental Group to provide environmental technical assistance to the California Energy Commission. Under Contract No. 700-05-002, I am serving as an Associate Biological Resource Specialist, Level II, to provide Peak Workload Support for the Energy Facility Siting Program and for the Energy Planning Program.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Biological Resources** for the **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 22, 2010 Signed: _____

At: Nevada City, California

C A R O L Y N C H A I N E Y - D A V I S

b o t a n i c a l c o n s u l t i n g

Carolyn Chainey-Davis, botanist

Over 23 years experience conducting biological inventories and impact assessments, rare plant and noxious weed surveys, large-scale vegetation mapping, wetland delineations, large-scale watershed assessments, designing and implementing mitigation & monitoring plans, habitat management plans, and restoration plans throughout California. Ms. Chainey-Davis field experience includes a diverse group of clients and projects from large transmission and hydro relicensing projects to urban and residential development projects, local, state and federal agencies, resource conservation organizations, landfill and mine reclamation projects, and many more. She led Garcia and Associates (GANDA) botanical studies for numerous FERC relicensing projects (PG&E & SCE) including Stanislaus River, Upper North Fork Feather River, Pit River, Vermillion, Bucks Lake and Poe hydro-relicensing projects, Transmission Separation project, Lower Owens River riparian monitoring, and hundreds of other large and small projects around the state.

Ms. Davis is past President of the California Native Plant Society, Nevada and Placer County Chapter and is a co-author of the recently published field guide "*Wildflowers of Nevada and Placer Counties*", published by the California Native Plant Society. Ms. Davis completed her wetland training at Portland State University and is certified for conducting wetland delineations based on the U.S. Army Corps of Engineers Wetland Delineation Manual. Ms. Chainey-Davis is skilled in the use of Trimble GeoExplorer series Global Positioning (GPS) equipment. As a botanist, she apprenticed for several years under some of the state's leading botanists, vegetation and wetland ecologists, including Robert Holland. Ms. Davis' continuing education includes several annual intensive botanical taxonomy workshops through the U.C. Berkeley Jepson Herbarium.

A Sampling of Relevant Project Experience

Project: Beacon Solar Energy Project Rosamond Water Alternative

Client: California Energy Commission (CEC)

Conducted detailed habitat assessment and vegetation mapping for a 40-mile alternative water pipeline alignment near Mojave, CA, in support of the Final Staff Assessment. CEC evaluated the feasibility of BSEP using an alternative source of water other than onsite potable groundwater and identified City of Rosamond tertiary treated wastewater as a feasible source. Prepared supplemental report describing the vegetation resources occurring along the southern 23 miles of the 39.61-mile Rosamond water pipeline alignment, including vegetation mapping and a rare plant habitat assessment. Assisted staff in the impact assessment for the proposed and preferred alternative.

Project: Lower Owens River Monitoring Program

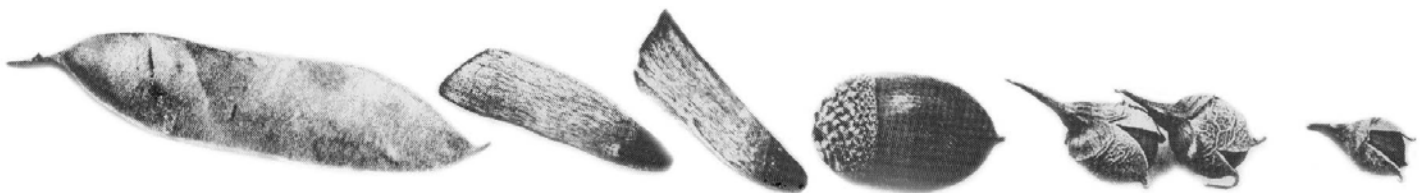
Client: Ecosystem Sciences

Member of a team of three biologists to design long-term monitoring program for collecting and analyzing data on riparian habitat and key wildlife habitat characteristics on 62 miles of the Lower Owens River. Directed field efforts to collect baseline data at 350 sites. Future monitoring, conducted after the initiation of appropriate flow and land management practices, will be compared against the baseline to determine if changes resulting from proposed restoration efforts (augmented stream flows) are consistent with the LORP goals and objectives.

Project: Open ended Contract for Biological Services

Client: Southern California Edison (SCE)

Led Garcia and Associates (GANDA) botanical studies (vegetation mapping, habitat assessments, etc.) in support of various SCE construction and relicensing projects in the central and southern Sierras, Sierra east slope and Great Basin region, and the eastern edge of the San Joaquin Valley.



- Project:** Stanislaus River Hydroelectric Project Relicensing Studies
Client: Pacific Gas and Electric Company, Technical and Ecological Services
 Led GANDA field efforts to conduct floristically-based botanical studies for the Federal Energy Regulatory Commission relicensing of four hydroelectric and transmission line projects located on the Stanislaus River, Stanislaus National Forest. Riparian and watershed vegetation mapping and sampling, special-status plant surveys, noxious weed mapping, and identify and map culturally significant Native American botanical resources for local tribes in support of the Federal Energy Regulatory Commission relicensing process. Prepared draft and final reports.
- Project:** Owens Lake Dust Control Project
Client: Garcia and Associates
 Conducted two years of floristically-based special status plant surveys and wetland delineations for the Los Angeles Department of Water and Power Owens Lake Dust Control mitigation project.
- Project:** Kern River Natural Gas Pipeline
Client: Garcia and Associates
 Conducted floristically-based special status plant surveys for the Daggett and Goodsprings segments of the interstate pipeline.
- Project:** Pit River Hydroelectric Project Relicensing Studies
Client: Pacific Gas and Electric Company, Technical and Ecological Services
 Led field efforts to conduct floristically-based special status plant surveys, noxious weed surveys, upland habitat mapping, and riparian vegetation classification and mapping for PG&E's Pit 3, 4, and 5 hydroelectric project in Shasta County in support of the Federal Energy Regulatory Commission relicensing process. Prepared draft and final reports.
- Project:** Upper North Fork Feather River and Poe Hydroelectric Projects, Lake Almanor Habitat Management Plan
Client: Pacific Gas and Electric Company, Technical and Ecological Services
 Led field efforts to conduct floristic surveys for special-status plant species and noxious weeds on the Upper North Fork Feather River (Plumas and Lassen National Forests) and Poe Project. Included GIS-based riparian and upland vegetation mapping in support the Federal Energy Commission relicensing process. Prepared draft and final reports. Also conducted detailed mapping of the wet meadows around Lake Almanor and prepared a long-term habitat management plan for meadow resources and willow flycatcher habitat.
- Project:** Transmission Separation Project
Client: Foster Wheeler Environmental Corporation
 Led field efforts to conduct floristically-based special-status plant surveys and noxious weed surveys for the PG&E Transmission Separation Project. GANDA botanists conducted surveys on selected transmission line segments and their associated access roads on USDA Forest Service (USFS) lands in the Plumas, Shasta-Trinity, Tahoe, and Eldorado National Forests, created GIS-based vegetation and noxious weed maps, and analyzed potential threats to special-status plant populations. Prepared draft and final reports.
- Project:** Nevada and Placer County projects – large and small subdivisions, infrastructure development, etc.
Client: Susan Sanders Biological Consulting and Beedy Environmental Consulting
 Conducted biological inventory and impact analyses and prepared mitigation plans for over 100 large and small subdivisions and infrastructure development projects in Nevada and Placer County. Lead writer and botanist. All projects included vegetation mapping, habitat assessments, floristic surveys, and mitigation planning. Prepared detailed habitat management plans and recreation/ trail plans for over a thousand acres of open space.
- Project:** Dog Ranch-Salmon Creek Conservation Project
Client: Robert Holland
 Conducted endangered species surveys and documented over 300 occurrences of special status plants (using Trimble data dictionary and population sampling protocol) for a proposed conservation easement/land swap on a 400+ acre ranch in Humboldt County on the Samoa Peninsula.

- Project:** **Field Guide to *Epilobium* in the Sierra Nevada, Tahoe National Forest**
Client: **U.S.D.A. Forest Service, Tahoe and Inyo National Forests (Open-ended Contract)**
 Conducted surveys for rare *Epilobiums* at seven sites in the Tahoe and Inyo National Forests and prepared a field guide to the genus *Epilobium* in the Sierra Nevada, with illustrations and keys to identification.
- Project:** **Bear Valley Meadow Restoration**
Client: **American Rivers**
 Sample design and long-range monitoring design and protocol for a large-scale meadow restoration project in Placer County. Included detailed vegetation mapping, conducting baseline inventory, and preparing report on sample design and results of baseline monitoring.
- Project:** **Shirrtail Creek Conservation Easement**
Client: **Beedy Environmental Consulting for Conservation Biology Institute**
 Conducted biological inventory and conservation assessment for 800-acre property on Shirrtail Creek in the American River watershed using protocol developed by The Nature Conservancy for conservation planning. Lead writer and botanist.
- Project:** **Natural Heritage 2020 Nevada County Watershed Assessment**
Client: **County of Nevada and Sierra Business Council**
 Lead botanist for a countywide watershed and ecosystem assessment. A two-year process funded by the Sierra Business Council and the County of Nevada to create a GIS database and biotic inventory of the county's natural habitats and wildlife resources, including an assessment of vegetation, special status and invasive for 98 sub-watershed basins in the county. Prepared botanical sections of the report, verified accuracy of more than 40 GIS data themes, assessed the extent and quality of each of the county's ecosystem types, potential to support special-status plants and animals.
- Project:** **Special Status Plant Surveys and Habitat Mapping for Rock Creek/Cresta Hydroelectric**
Client: **Pacific Gas and Electric Company, Technical and Ecological Services**
 Conducted floristically-based special status plant surveys and habitat mapping for PG&E's Rock Creek-Cresta hydroelectric facility project area and 72-mile transmission line in Plumas, Butte, Yuba and Sutter counties.
- Project:** **Osborne Hill Open Space Habitat Management Plan**
Client: **Susan Sanders Biological Consulting**
 Prepared detailed, goal-driven, long-range habitat management plan for 250 acres of open space for a residential development in Nevada County. Included guidelines for forest management to promote old-growth conditions, fuels management specifications, habitat management specifications, and designs and implementation plan for recreational trails, educational signage, and formation of an independent non-profit land trust to manage the open space. Prepared similar plans for several other residential developments in Nevada County.
- Project:** **Ragsdale Creek Setback Study**
Client: **Susan Sanders Biological Consulting & County of Nevada**
 Identified, described, and mapped important biological resources on an urban stream in Nevada County and recommended appropriate development setbacks to avoid/minimize impacts, assessed potential impacts to the creek as a result of adjacent development, and recommended mitigation measures to reduce impacts. Coordinated with County GIS Department in production of map of sensitive resources, and presented results of study to citizen advisory committee.
- Project:** **Open ended Contract for Biological Services, Various Transmission Projects**
Client: **Pacific Gas & Electric Company (PG&E)**
 Led Garcia and Associates (GANDA) botanical studies (rare plant surveys, vegetation mapping, habitat assessments, etc.) in support of various PG&E transmission projects throughout California, including Kern #304, Northeast San Jose Reinforcement, Atlantic-Del Mar, Butte Reinforcement, and many more.
- Project:** **Open ended Contract for Biological Services, Transmission Relicensing Projects**
Client: **Southern California Edison (SCE)**
 Led Garcia and Associates (GANDA) botanical studies (vegetation mapping, habitat assessments, etc.) in support of various SCE construction and relicensing projects in the central and southern Sierras, Sierra east slope and Great Basin region, and the eastern edge of the San Joaquin Valley.

DECLARATION OF

Amy Golden

I, **Amy Golden**, declare as follows:

1. I am presently employed by the California Energy Commission Facilities Siting Office of the Systems Assessments and Facilities Siting Division as a **Planner II**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepared the staff testimony on **Biological Resources** for the **Genesis Solar Energy Project** based on my independent analysis of the application and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 23, 2010 Signed: _____

At: Sacramento, California

Amy W. Golden

Employment History

California Energy Commission

Planner II, Staff Biologist

11/2009 to present

As a Staff Biologist with the Energy Commission, Ms. Golden analyzes the biological resource components of energy facilities siting applications to assess resource impacts, develop mitigation plans, and to evaluate compliance with applicable local, state, and federal laws, ordinances, regulations, and standards. In addition, she works closely with biological resource protection and management agencies and subject matter experts to ensure input into the Energy Commission and facility licensing process.

Foothill Associates

Wildlife Biologist

03/2005 to 10/2009

While working as a private environmental consultant with Foothill Associates as a Wildlife Biologist, Ms. Golden assisted with ESA Section 7 Biological Assessments and Clean Water Act 404 permit applications primarily for private residential and commercial development projects. She performed field habitat assessments; focused species surveys for reptiles, amphibians, and vernal pool invertebrates; wetland delineations; raptor surveys; and arborist surveys. Ms. Golden performed the biological impact analysis for several parks master planning and proposed specific plan area projects. Amy also assisted with the preparation of riparian habitat mitigation plans pursuant to Section 1600 of California Fish and Game Codes and Wetland Mitigation Plans in support of Clean Water Act Section 404 Army Corps permit issuance and compliance. Ms. Golden also served as the biological lead on many CEQA projects and performed the biological field work and prepared the biological resources section for several CEQA documents.

Analytical Environmental Services

Biologist

09/2004 to 02/2005

While with the environmental consulting firm Analytical Environmental Services as a Staff Biologist, Amy assisted with the preparation and analysis of many NEPA documents primarily for tribal projects. Ms. Golden prepared biological impact analyses and coordinated with local resource agencies on the development of mitigation plans to minimize impacts to sensitive biological resources. Amy also performed field biological assessments, wetland delineations, elderberry shrub impact assessments, and focused plant and wildlife surveys.

The Nature Conservancy

Biologist

04/2004 to 07/2004

Ms. Golden worked on a field crew as a seasonal field biologist on a long-term avian monitoring project with The Nature Conservancy to monitor the use of montane meadows and forest edges by birds in the Sierra Nevada mountain range. Ms. Golden performed avian point counts utilizing the Variable Point Count method to document avian bird diversity in the Tahoe National Forest. Amy

operated a GPS unit, recorded all birds observed based on visual surveys and auditory calls and input all collected data into a Microsoft Excel database.

Sapphos Environmental, Inc.

Wildlife Biologist

05/2002 to 03/2004

As a Wildlife Biologist with Sapphos Environmental, Inc., Ms. Golden performed field habitat assessments in support of biological technical analyses and reports. Amy assisted with dry desert wash delineations, desert tortoise habitat assessments and focused surveys, Incidental Take Permit applications, and several CEQA biological resources sections. Amy coordinated with local resource agencies on the development of appropriate mitigation plans and land acquisitions on several Section 7 ESA permitting projects.

EDUCATION

Environmental Forest Biology

Bachelor of Science

State University of New York, College of
Environmental Science and Forestry

May 2000

Field Ecology

University of California Riverside Extension

Certificate in Field Ecology

February 2004

Veterinary Science Technology

State University of New York at Delhi

Associate of Applied Science

May 1997

DECLARATION OF

I, Sara Keeler declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities Siting Office of the Systems Assessments and Facilities Siting Division as a Planner.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony and errata on **Biological Resources** for the **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony and errata is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and errata and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated:_____ Signed:_____

At: Sacramento, California

Sara M. Keeler

Employment History

California Energy Commission

Planner II, Staff Biologist

12/2009 to present

As a staff biologist with the Energy Commission, Ms. Keeler analyzes the biological resource components of energy facilities siting applications to assess resource impacts, develop mitigation, and to evaluate compliance with applicable local, state, and federal laws, ordinances, regulations, and standards. This requires working closely with biological resource protection and management agencies, subject matter experts, and Energy Commission consultants as well as with other Energy Commission staff to provide the best available information is included in staff analyses.

California Department of Transportation, District 3

Associate Environmental Planner/Environmental

11/2007 to 12/2009

Ms. Keeler's primary duties with Caltrans were to coordinate and complete environmental documents to satisfy CEQA, NEPA, regional, and permitting requirements, and act as the Project Biologist on various transportation-related projects in California.

Entrix, Inc.

Senior Staff Scientist/Staff Scientist

01/2005 to 11/2007

While with the environmental consulting firm Entrix, Inc., Ms. Keeler specialized in California wildlife and floristics studies. She worked throughout California including in the Lake Tahoe Basin, Great Basin, Central Valley, Sierra Nevada, in coastal California, and desert areas. Projects while at Entrix included biological resource field studies such as habitat assessments, protocol-level surveys for special-status plants and animals, wetland delineations, and riparian surveys; project, task, and budget management; and writing biological resources sections of a variety of documents including documents to satisfy NEPA and CEQA requirements, environmental assessments, and existing conditions reports.

USDA, Forest Service, Pacific Southwest Research Station

Biological Sciences Technician

05/2001 to 09/2002

Ms. Keeler conducted breeding bird surveys and vegetation inventories and assessments on a breeding bird survey crew in the Sierra Nevada. This included conducting surveys using a variety of techniques including tree-climbing (ascenders, 3-point climbing, Swedish ladders), auditory surveys, and vegetation sampling.

EDUCATION

Biological Sciences (Evolution and Ecology)
University of California, Davis

B.S (High Honors)
June 2004

DECLARATION OF

I, Mark Massar, declare as follows:

1. I am presently employed by the Bureau of Land Management as a Wildlife Biologist.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony and errata on **Biological Resources** for the **Genesis Ford Dry Lake Solar Power Project** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony and errata is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and errata and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: 1 MAR 2010 Signed: Mark Massar

At: Palm Springs, California

Mark Massar
Bureau of Land Management
1201 Bird Center Drive
Palm Springs, CA 92262

Education

B.S., Forestry and Natural Resource Management, University of California, Berkeley

M.S., Biological Sciences, California Polytechnic State University Pomona

Work Experience

Bureau of Land Management, Palm Springs, California. Wildlife Biologist (2005- Present).

Currently serving as the overall program lead for wildlife and habitat management in the BLM Palm Springs-South Coast Field Office. Prepare and monitor wildlife habitat management plans. Participate in the preparation and review of land use and activity plans, environmental impact statements, and environmental assessments. Work with local groups to promote and sustain cooperative wildlife conservation interest and volunteerism. Provide input to the BLM Annual Work Plan and budget process regarding the wildlife habitat management program, and monitor work progress during the year. Serve as the Bighorn Sheep Program lead by planning, developing, evaluating, and monitoring the program for the Field Office. Review project proposals to assess their potential impact on wildlife and their habitats. Conduct field inventories in support of biological analyses. Facilitate compliance with the Endangered Species Act as required, by preparing Biological Assessments and working with contractors for accurate completion of Biological Assessments. Coordinate closely with the U.S. Fish and Wildlife Service to proactively address biological issues and facilitate timely completion of the Section 7 consultation process. Foster community relationships by participating in interagency planning efforts and activities, such as the flat-tailed horned lizard committee, the Coachella Valley fringe-toed lizard preserve committee, the Desert tortoise recovery team, the Dos Palmas Management Committee, Coachella Valley Multi-Species Habitat Conservation Plan, and the Peninsular Rangers Bighorn Sheep Recovery Team. Prepare and submit grant proposals in support of resource management projects; provide input and facilitate successful submission of office-wide grant proposals.

Charis Corporation, Fort Irwin, California. Ecologist. (2000 - 2005). Worked as an ecologist for the Directorate of Public Works, Natural Resources Division. Ensured post compliance with the Endangered Species Act, Migratory Bird Treaty Act, and the National Environmental Policy Act. Implemented Fort Irwin's Integrated Natural Resources Management Plan and Endangered Species Management Plan. Developed, conducted, and oversaw monitoring of plant and animal species, especially the desert tortoise. Conducted biological assessments and Section 7 consultations of the Endangered Species Act. Developed databases for the data generated by monitoring and survey activities insuring the data and databases conformed to appropriate standards and were accessible through the use of geographic information systems. Developed and reviewed scopes of work for university studies and surveys. Participated in numerous outreach and educational programs on desert ecology for base personnel and surrounding communities in Southern California.

Computer Sciences Corporation, Edwards Air Force Base, California. Wildlife Biologist (1998-2000). Worked as a wildlife biologist providing natural resource program support for Environmental Management on Edwards Air Force Base. Duties included ensuring Base compliance with Federal

environmental laws. Technical support included conducting biological surveys, monitoring projects for compliance with environmental laws, preparing environmental assessments and other NEPA documents by analyzing potential environmental impacts to natural and developing protection measures to minimize project impacts, conducting natural resource damage assessments by designing survey protocols, training surveyors, analyzing data, and writing damage assessment reports.

National Park Service. Biological Science Technician (1994-1997). Researched, developed, and presented interpretive programs on the natural history of the Sonoran Desert for Saguaro National Park. Was the primary coordinator of the Saguaro National Park's summer Junior Ranger program. Assisted in a bighorn sheep inventory study at Joshua Tree National Park, which involved designing the survey protocol, developing standardized data recording forms, spending 160 hours in a blind recording sheep behavior, and identifying individual sheep using photography. Assisted in a desert tortoise home range study by radio-tracking desert tortoises at Joshua Tree National Park. Organized and conducted biological surveys for amphibians, including foothill yellow-legged frog (*Rana boylei*), mountain yellow-legged frog (*R. muscosa*), red-legged frog (*R. aurora*), and Yosemite toad (*Bufo canorus*) in Yosemite, Sequoia, and Kings Canyon national parks. Fieldwork involved the location of appropriate habitat for amphibian species, measurement of aquatic habitat parameters, identification of all amphibians encountered, behavioral studies on reproduction and predation, analysis of blood samples for environmental toxin studies. Numerous reports were prepared on survey findings for the National Biological Service and cooperating Forest Service offices. Extensive planning was undertaken to organize field work into backcountry areas, with most trips lasting 10 days.

Bureau of Land Management, El Centro, California. Biological Science Technician (1993). Organized and conducted biological surveys for threatened lizards in the California desert, including the flat-tailed horned lizard (*Phrynosoma mcalii*) and Colorado Desert fringed-toed lizard (*Uma notata*). Work involved weighing and measuring lizards, and precisely describing habitat conditions, including vegetation structure and composition, microhabitat conditions, and human-caused disturbances. Conducted scientific literature searches for information on the natural history, distribution, and possible causes of decline for these lizards.

California Department of Fish and Game, Bishop, California. Fisheries Technician (1992). Assisted a team of fisheries biologists to accomplish diverse management objectives. Work included the operation and maintenance of a fish weir, conducting creel surveys, electroshocking fish, monitoring the status of rare amphibians in the Sierra Nevada, habitat mapping, assessing the population and breeding status of amphibians, and writing reports of findings.

United States Forest Service, Foresthill, California. Forestry Technician (1991). Inspected silvicultural contract work (i.e., planting, thinning, site preparation) for compliance with government contracts. Explained steps necessary for compliance to contractors and reported violations to supervisor. Examined sapling and larger stands to collect and record data on stocking, disease, site quality, and vegetation. Made recommendations for areas requiring remedial action. Examined plantations to assess numbers of tree seedlings present, condition, growth and survival rates, and evidence of animal damage.

DECLARATION OF
Susan D. Sanders

I, **Susan D. Sanders**, declare as follows:

1. I am presently under contract with Aspen Environmental Group to provide environmental technical assistance to the California Energy Commission. Under Contract No. 700-05-002, I am serving as a Biological Resource Specialist and Project Manager to provide Peak Workload Support for the Energy Facility Siting Program and for the Energy Planning Program.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Biological Resources** for the **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 3, 2010 Signed: 

At: Nevada City, California



Susan Sanders Biological Consulting

*12213 Half Moon Way
Nevada City, California 95959
Phone: (530) 477-7415 Fax: (530) 477-7580
ssanders55@comcast.net*

RESUME OF SUSAN SANDERS

EDUCATION

Ph.D. Zoology University of California, Davis (1983)
M.A. Zoology University of California, Davis (1979)
B.A. Zoology University of California, Berkeley (1976)

PROFESSIONAL AFFILIATIONS/CERTIFICATIONS

Wildlife Society, Sacramento-Shasta Chapter
Sierra Nevada Willow Flycatcher Working Group
Certified by California Unified Certification Program as DBE/WBE firm (UCP # 25204)

CONTINUING EDUCATION (UC Davis, University Extension)

Threatened and Endangered Reptiles and Amphibians of Northern California
Wetlands Regulations, Impacts, and Mitigation
Endangered Species: Resources, Law, and Potential Solutions
Resolving Endangered Species Conflicts: Practical Approaches to Problem Solving

REGULATORY COMPLIANCE EXPERTISE in coordination with state, federal, and local agencies in the environmental review process for projects regulated by the California Environmental Quality Act, National Environmental Policy Act, Federal and State Endangered Species Acts, National Fish & Wildlife Coordination Act, Clean Water Act, and California Coastal Act. Also experienced in providing technical support and agency coordination for license and permit applications.

TECHNICAL EXPERTISE in surveys for threatened and endangered wildlife species; biological inventories; habitat management plans; raptor surveys; wildlife habitat assessment; mitigation monitoring; expert testimony, constraints analysis; sensitive species research. Prepared Biological Assessments for endangered, threatened, and candidate species, and conducted field surveys and literature reviews for willow flycatchers, tricolored blackbirds, Swainson's hawks, burrowing owls, California spotted owls, San Joaquin kit fox, bald eagles, valley elderberry longhorn beetles, and many other special-status species. Conducted surveys for raptor species of special concern, including white-tailed kite, northern goshawk, and Cooper's hawk.

PROJECT MANAGEMENT EXPERIENCE on large and complex projects, including a two-year survey of 11,000 acres in the Plumas National Forest for a proposed land exchange, involving supervision of eight technical specialists and subconsultants. Responsible for overseeing numerous transportation and revegetation projects and mitigation monitoring programs which involved budget, personnel, and subconsultant management, agency and client coordination, and preparation of technical reports. Managed long-term (five-year) revegetation/mitigation monitoring projects with annual reporting requirements.

CONSULTING EXPERIENCE (1982 - 2007)

CALIFORNIA ENERGY COMMISSION TECHNICAL ASSISTANCE

Currently assisting the CEC in evaluating the environmental aspects of new power plant applications throughout the state, and also providing technical expertise as an avian specialist. I have completed or am currently involved in the following projects:

- **California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development in California:** Currently serving as author and coordinator for a statewide effort to develop science-based protocols for pre-and post-construction monitoring to assess the effects of wind energy development on birds and bats. Worked closely with CEC and California Department of Fish and Game staff, coordinated the efforts of an eight-member Science Advisory Committee, helped organize public workshops, worked with wind energy developers, and non-governmental organizations on this collaborative guidelines effort.
- **Pastoria Energy Facility Expansion.** Worked with CEC staff in reviewing the Application for Certification and associated reference material, prepared Data Adequacy Form, Data Request, Preliminary and Final Staff Assessment.
- **San Francisco Energy Reliability Project:** Reviewed the Application for Certification and related information material, met with CEC staff and United States Fish and Wildlife Service regarding endangered species issues, prepared and Final Preliminary Staff Assessment.
- **Black Mountain Wind Energy and 69kV Transmission Line Project:** Acting as CEC's avian specialist, reviewed the extensive literature of effects of wind development on avian populations, met with the Public Interest Energy Research staff, and prepared a comment letter on behalf of CEC for the Notice of Preparation for this project.
- **Notice of Preparation Review for Proposed Wind Energy Project:** Provided comment letters on behalf of CEC for the Notice of Preparation for Shiloh II Wind Plant Project (Solano County), and WECS 20 Project (City of Desert Hot Springs).

LITIGATION SUPPORT/EXPERT WITNESS

El Portal Road Improvement Project. Conducted field surveys and reviewed the Biological Assessment, Environmental Assessment/FONSI for the El Portal Road Improvement Project litigation (Sierra Club *et al.* vs. National Park Service). Prepared declarations and response to defendants opposition briefs, and provided other technical assistance to project attorneys. (Client: Mariposans for Environmentally Responsible Growth and Sierra Club).

Merced River Plan. Conducted field surveys and reviewed the Merced Wild and Scenic River Comprehensive Management Plan and Final Environmental Impact Statement (Sierra Club *et al.* vs. National Park Service). Prepared declarations and response to defendants opposition briefs, and provided other technical assistance to project attorneys. (Client: Friends of Yosemite Valley and Sierra Club).

Lower American River Instream Flows. Conducted original research and provided declarations on the effects of reduced instream flow to wildlife for the Friends of the American River v. EBMUD, Lower American River. Provided technical assistance to project attorneys,

prepared declarations, and provided expert testimony before the State Water Resources Control Board. (Client: Sacramento County and Friends of the American River Parkway).

Putah Creek v. Solano Irrigation District. Litigation support and expert testimony regarding wildlife/fishery impacts of reduced flows in Putah Creek. Provided depositions, declarations, expert witness testimony, and other litigation support (Client: Putah Creek Council).

CEQA/NEPA Documents. Prepared biological resource sections of Environmental Impact Reports/Statements, Initial Studies, and Environmental Assessments for numerous commercial and residential developments, redevelopment projects, transportation projects, dams, and other water projects throughout northern California. Conducted wildlife and plant community surveys, habitat assessments, agency contacts, data analysis and report preparation. Secured 1602 Streambed Alteration Agreements from California Department of Fish and Game, Section 404 Permits from U.S. Army Corps of Engineers, and 401 Permits from Regional Water Quality Control Board. Some representative projects include:

- Pacific Bell Route 101 Fiber Optic Cable, Kern County (PAR Environmental Services, Inc. [PAR]);
- Higgins Corner Marketplace, Nevada County (FHK Development);
- Hinkle Creek Nature Area Biological Inventory/Impact Analysis, Folsom (PAR);
- Willow Flycatcher Surveys, Lake Isabella Project, Kern County (Jones & Stokes);
- Biological Resources Survey, Galilee and TRC Parcels, Roseville, Placer County (PAR);
- Burrowing Owl Impact Analysis/Mitigation Monitoring, Northpointe, Sacramento County (PAR);
- Laguna Creek Interceptor and Sewer Alignment Constraints Study, Sacramento County (PAR);
- Marin Public Safety and Emergency Radio System Project, Marin County (Cord Communication)
- Biological Studies for Endangered Species Compliance, Isabella Dam, Kern County (PAR);
- Granite Quarry, Placerville (The Bedrock Group);
- Pacific-Bell Rocklin Central Dialing Station, Rocklin, Placer County (PAR);
- Whitney Oaks Raptor Surveys, Placer County (Live Oak Enterprises/Pulte Homes);
- Auburn Ranch Subdivision Project, Placer County (Area West Engineers);
- Equestrian Ridge Estates, Placer County (PAR);
- Willow Creek Assessment District Swainson's Hawk Surveys, Sacramento County (PAR);
- Bucks Lake Spotted Owls Surveys, Menasha Corporation, Plumas County (PAR);
- Roseville Water Facilities Project, City of Roseville, Placer County (Geier & Geier Consulting);
- Sugar Bowl Ski Resort Expansion, Placer County (Omni-Means, Engineers/Planners);
- City of Lincoln Waste Water Treatment Plant Expansion, Placer County (City of Lincoln);
- The Heritage at Bickford Ranch, Placer County (Geobotanical Phenomenology);
- South Branch 60 kV Pole Line Project, Roseville, Placer County (PAR);
- Smith-Moulton Pipeline Project, Nevada County (PAR);
- Morada Ranch Annexation, San Joaquin County (Omni-Means);
- Clover Valley Lakes Estates EIR, Placer County (Planning Concepts);
- Turtle Island, Loomis, Placer County (Export International);
- Fort Hunter-Liggett Wildlife Resource Surveys, Monterey County (Jones & Stokes Associates);
- Superconducting Super Collider EIR/EIS, Yolo and Solano Counties (EIP Associates);
- South Lake Tahoe Redevelopment Agency EIR, El Dorado County (Wagstaff & Brady);
- Stanford Ranch EIR, Placer County (Jones & Stokes Associates);
- Northeast Roseville Specific Plan EIR, Placer County, Placer County (Jones & Stokes Associates).
- Teichert/Granite Aggregate Mining Site, Sacramento County (Holliman, Hackard, & Taylor);
- Lower Laguna Drainage Master Plan, Sacramento County (PAR);
- Natomas Ditch Abandonment and Pipeline Construction Project, Sacramento County (PAR);
- Tuolumne River Wildlife Studies for FERC License, Tuolumne County (Holton & Associates);
- Turner Creek Hydroelectric Project, Plumas County (Jones & Stokes Associates);
- Calabazas Creek Flood Control Project, Santa Clara County (Santa Clara Valley Water District).

Transportation Projects. Prepared Caltrans Natural Environment Study Reports, Biological Assessments, Categorical Exemption/Exclusions, Preliminary Environmental Study Forms, and other documentation for bridge replacements, interchange modifications, seismic retrofits, road widenings, emergency storm damage repairs, and other transportation projects in Caltrans Districts 1, 2, 3, 4, 5, 6, and 10. Representative projects include:

- Auburn Boulevard Improvement Project, Citrus Heights, Sacramento County (PAR)
- Valley Drive Bridge Replacement Project, Nevada County (Nevada County DOTs)
- SR 101/Prado Rd. Interchange Improvement Project, San Luis Obispo County, (PAR)
- I-580/Isabel Avenue Interchange Project, Livermore, Alameda County (PAR);
- Gladding Road Bridge Replacement, Coon Creek, Placer County (Planning Concepts);
- Lozanos Road Bridge Replacement, Auburn Ravine, Placer County (PAR);
- Coyote Creek Bridge Replacement Project, Calaveras County (PAR);
- Route 99/Route 120 East Interchange Project, Manteca, San Joaquin County (PAR);
- Route 99/Prado Road Interchange, San Luis Obispo County (PAR);
- Ralston Avenue/Route 101 Interchange, Belmont, San Mateo County (PAR);
- Route 1 Improvement Project, Sand City to Seaside, Monterey County, PEAR (PAR);
- Northeast Area Transportation Plan, Constraints Analysis, Sacramento (PAR);
- Wilbur Avenue Overcrossing Project, Antioch, Contra Costa (PAR);
- Alpine Road Storm Damage Repair, San Mateo County (PAR);
- Pescadero Road Storm Damage Repair, San Mateo County (PAR);
- Route 92 Widening, Half Moon Bay, San Mateo County (PAR);
- Route 99/Hammer Lane Interchange Improvements, Stockton, San Joaquin County (PAR);
- Hammer Lane Widening, Stockton, San Joaquin County (PAR);
- La Gonda Way and Paraiso Drive Bridge Seismic Retrofit, Danville, Contra Costa County (PAR);
- Highway 162 Bridge Storm Damage Repair Project, Sacramento River, Glenn County (PAR);
- Norwood Avenue Reconstruction Project, Sacramento County (Planning Center);
- HOV Lane Construction, US 50, Sunrise to El Dorado Blvd., Sacramento/El Dorado Co. (PAR);
- Dry Creek Bridge Replacement Project, Route 99, Butte County (PAR);
- Ladies Canyon Bridge Storm Damage Repair, Sierra County, (PAR);
- Emergency Storm Damage Repair, Routes 49 and 89, Sierra and Nevada Counties, (PAR);
- Emergency Storm Damage Repair Project for: Route 70/89, Feather River Canyon, Route 20, 147, Plumas, Nevada, and Butte Counties, (PAR);
- Interstate 5 - Benjamin Holt/Hammer Lane Interchange project, San Joaquin County (PAR);
- State Route 113/Interstate 5 Connector Study, City of Woodland, Yolo County, California (PAR);
- Frederickson Road Widening, Antioch, Contra Costa County (May Consulting);
- East Lime Kiln Road Reconstruction Project, Nevada County (PAR);
- Lower Sacramento Road and Bridge Widening, Stockton, San Joaquin County (May Consulting);
- Sierra College Boulevard Widening Project, Roseville, Placer County (PAR);
- State Route 50/Folsom Interchange Improvement Project, Sacramento County (PAR);
- Pico Creek Bridge Replacement Project, Route 1, San Luis Obispo County (PAR)
- Burns Creek Bridge Replacement Project, Route 1, Monterey County (PAR);
- Pajaro River Bridge Replacement Project, Monterey and San Luis Obispo Counties (PAR);
- Route 113 Widening/North 1st Street Improvements, Dixon, Solano County (Planning Concepts);
- Bridgeport School Bridge Replacement Project, El Dorado County (PAR);
- State Route 49 Widening, Auburn, Placer County (PAR);
- Claus Road Bridge Widening, Modesto, Stanislaus County (PAR);
- Interstate 80/Enterprise Boulevard Interchange, City of West Sacramento, Yolo County (PAR).

Nevada County Biological Inventories/Habitat Management Plans. Conducted site specific vegetation and wildlife surveys in accordance with Policy 13.2A of the Nevada County General Plan; prepared Management Plans in accordance with Sec. L-II 4.3.3, General Provisions of the July 27, 2000 Zoning Ordinances. Representative projects include:

- Waxman Parcel Biological Inventory, Old Wood Road (Nevada City Engineering)
- Habitat Management Plan for DesJardins Dry Creek Crossing (Cranmer Engineering)
- Gregory Creek Biological Inventory, Truckee (King Engineering)
- Landon Parcel Biological Inventory and Management Plan, Wolf Road (California Survey Company)
- Oslin-Tarkowski Biological Inventory, Peardale (Ms. Jeanette Oslin)
- Jackson Parcel, Purdon Road (Mr.
- Hyatt Property Biological Inventory and Management Plan, Dry Creek (Mr. Mike Hyatt)
- Penn Valley Community Church, Penn Valley (Mr. Keith Brown)
- Chapa-De Health Clinic, Grass Valley (Ms. Elaine. Lieske, Architect)
- Inventory and Management Plan for Agren Pond Project, Penn Valley (Mr. Ray Agren)
- Humboldt Lily Plant Preservation Plan (Sares-Regis Group)
- Moore Property, Chicago Park (American Surveys)
- Callaghan Property, Lake of the Pines (Sylvester Engineering)
- Tracy Property, Duggans Road (Cranmer Engineering)
- Ragsdale Creek Setback Study, Higgins Area (Nevada County Planning Department)
- CDFG 1603 Permit Application, Eskaton Village, Grass Valley (Sares-Regis Group)
- Cedar Ridge Baptist Church Expansion, Cedar Ridge (Cedar Ridge Baptist Church)
- Penn Valley Properties, Penn Valley (Sylvester and Creighton)
- Record Connection Property, Brunswick Basin (Daggett Design)
- Droitcour Property, Wolf Road (Mr. Gerald Stapp)
- Hyepark Estates, near Wolf Road (King Engineering)
- Bartel Property Lake Setback (Nevada City Engineering)
- KLOVE Radio Tower, Banner Mountain (Westower Communications)
- Haas-Menasha Property, Ponderosa Way, Rough and Ready (Cliff McDivitt Surveying)
- Eskaton Village, Grass Valley (Sylvester & Creighton)
- Quist Property, Higgins Corner (Sylvester & Creighton)
- Hobart Mills Industrial Park (Sylvester & Creighton)
- Milhous Ranch, North San Juan (Sylvester & Creighton)
- Extasia Workshop Project, Tyler Foote Crossing Road, San Juan Ridge (Mr. Bruce Boyd, AIA);
- Flynn Property, Retrac Way, Grass Valley (Mr. Martin Flynn);
- McGuire Property, Banner Lava Cap Road, Nevada City (Mr. Kirk McGuire);
- Biological Inventory for 240-acre parcel near Donner Lake (Mr. James Mitchell);
- Brunswick Inn Project, Grass Valley (Sylvester Engineering);
- Lopez Tentative Map, Scott's Flat Road (Sylvester Engineering);
- Sierra Knoll Estates, Higgins Corner (Mr. and Mrs. Steve Joos);
- Smallwood Property, Grass Valley (Mr. Jay Smallwood).
- Harmony Ridge Resort (Sylvester & Creighton)

Land Exchanges. Prepared Biological Assessments/Evaluations for Forest Service land exchanges in the Plumas National Forest. The largest of these was the 11,000 acre Soper-Wheeler Company land exchange, a two-year project requiring management of eight employees and several subconsultants for surveys of rare plants, California spotted owls, northern goshawks, red-legged frogs, and other sensitive species. Other projects include the Crites Mineral Fraction Land Exchange and the Saunders Land Exchange, Plumas National Forest, (PAR).

Mitigation Monitoring. Supervised the design and ongoing monitoring of wetland and sensitive species mitigation projects, including riparian revegetation, vernal pool creation, and mitigation banking. Some projects involved preparation of a Habitat Mitigation and Monitoring Plan, and long-term monitoring efforts (five years plus), as well as preparation of annual reports, and

coordination with US Army Corps of Engineers, US Fish and Wildlife Service, California Department of Fish and Game, California Department of Transportation, and the US Environmental Protection Agency. Projects include:

- Humboldt Lily Mitigation Monitoring, Eskaton Village, Nevada County (Eskaton)
- Dark Horse Mitigation Monitoring, Nevada County (Nevada City Engineering)
- Northpointe, Burrowing Owl Mitigation Monitoring, Sacramento County (PAR)
- Burrowing Owl Mitigation Monitoring, Meadowview, Sacramento County (PAR)
- Wilbur Avenue Overhead Project, Habitat Restoration for Lange's Metalmark Butterfly, Antioch, Contra Costa County, (PAR)
- Swainson's Hawk Nest Monitoring, Garden Highway, Sacramento, Sacramento County (PAR)
- Sierra College Boulevard Riparian Revegetation Monitoring, Roseville, Placer County (PAR);
- Roseville Sanitary Landfill Riparian Revegetation Project, Roseville, Placer County (PAR);
- State Route 99/Calvine Interchange Vernal Pool Vegetation and Fairy Shrimp Mitigation Monitoring, Sacramento County (PAR);
- Potrero Hills Landfill Bird Deterrence Monitoring, Solano County (Global Environmental);
- State Route 50/Folsom Boulevard Improvement Project, Beach Lakes Mitigation Bank (PAR);
- Niblick Bridge Riparian Revegetation and Mitigation Monitoring, San Luis Obispo County (PAR).

TEACHING EXPERIENCE

Lecturer. Biology 10, UCD Zoology Department (1985): Instructor - biology for non-majors.

Lab Coordinator. Zoology 2L, UCD Zoology Department (1983-1984): Trained and supervised teaching assistants, managed introductory zoology laboratories.

Teaching Assistant. UCD Zoology Department (1977-1983): General Zoology, Vertebrate Structure, Introductory Biology.

Outstanding UCD Graduate Teaching Assistant (1983).

PUBLICATIONS

California Energy Commission and California Department of Fish and Game. 2007.

California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development. Commission Final Report. California Energy Commission, Renewables Committee, and Energy Facilities Siting Division, and California Department of Fish and Game, Resources Management and Policy Division. CEC700-2007-008-CMF.

Beedy, E. C., S. D. Sanders, and D. A. Bloom. 1991. Breeding status, distribution, and habitat associations of the tricolored blackbird (*Agelaius tricolor*), 1850-1989. June 21, 1991. Jones & Stokes Associates (JSA 88-187.) Sacramento, CA. Prepared for USFWS, Sacramento, CA.

Flett, M. A. and S. D. Sanders. 1987. Ecology of a Sierra Nevada population of Willow Flycatchers. *Western Birds*. 18:37-42.

Fowler, C., B. Valentine, S. Sanders, and M. Stafford. 1991. Habitat Suitability Index Model: Willow Flycatcher (*Empidonax traillii*). USDA Forest Service, Tahoe National Forest.

Harris, J. D., S. D. Sanders, and M. A. Flett. 1987. Willow Flycatcher surveys in the Sierra Nevada. *Western Birds*. 18:27-36.

Sanders, S. D. 1983. Foraging Ecology of a Sierra Nevada population of Douglas Tree Squirrels (*Tamiasciurus douglasii*). Ph.D. Dissertation, University of California, Davis.

Sanders, S. D. and M. A. Flett. 1989. The ecology of a Sierra Nevada population of Willow Flycatchers (*Empidonax traillii*), 1986 and 1987. California Management Branch Administrative Report No. 89-3, California Department of Fish and Game.

DECLARATION OF
Elizabeth A. Bagwell

I, **Elizabeth A. Bagwell**, declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, **Siting, Transmission, and Environmental Protection Division**, as a cultural resources technical specialist.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I assisted in the preparation of the staff testimony on **Cultural Resources** for the Genesis Solar Energy Project, based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: February 23, 2010

Signed: _____

Elizabeth A. Bagwell

At: Sacramento, California



DR. ELIZABETH A. BAGWELL
Associate, Cultural Resources

ACADEMIC BACKGROUND

PhD, Anthropology (Archaeology), University of New Mexico, 2006
MA, Anthropology (Archaeology), UC Berkeley, 1995
Certificate in Archaeological Technology, Cabrillo College, 1994
BA, Anthropology and Creative Writing, UC Santa Cruz, 1991

PROFESSIONAL EXPERIENCE

Elizabeth A. Bagwell recently joined Aspen as an Associate in Cultural Resources. She has 19 years of experience conducting field work, researching, analyzing, and writing about archaeology and anthropology. She has experience preparing environmental documents pursuant to applicable federal, state and local regulations in California, Arizona, New Mexico and internationally in Mexico. These documents emphasize compliance with the National Environmental Policy Act (NEPA), Section 106 of the National Historic Preservation Act (NHPA), Native American Graves Protection and Repatriation Act (NAGPRA), and California Environmental Quality Act (CEQA). She is an expert in explaining cultural resource preservation and mitigation to rural community members in both English and Spanish. She is a specialist in the archaeology of the Sonoran and Chihuahuan Deserts of the United States and Mexico and has published several academic articles based on her studies of architecture and craft production in ancient North America.

Aspen Environmental Group

December 2009 to present

Dr. Bagwell is currently providing technical support to the following project:

California Energy Commission – Cultural Resources Assessment for the Genesis Solar Energy Project. Dr. Bagwell is currently serving as the lead technical staff for the analysis of impacts to cultural resources from the 250 MW power plant in an undeveloped area of the Mojave Desert near Dry Ford Lake. Important cultural issues include direct impacts to prehistoric Native American and historic World War II military maneuver sites and potential indirect impacts to a traditional cultural property (TCP).

Desert Archaeology, Inc. – Tucson, Arizona

2007-2009

Dr. Bagwell served as a project manager for a variety of cultural resources mitigation projects for on-call clients – the City of Phoenix, Phoenix Aviation Department, and the Salt River Project. Some of these include:

- **Phoenix Sky Harbor International Airport Automated Train Project, Maricopa County, Arizona - City of Phoenix Aviation Department.** Co-author of the cultural resources treatment plan outlining compliance with local, state, and federal regulations for ground

disturbance at the National Register of Historic Places listed Pueblo Grande Museum and Archaeological Park. Project manager for field mitigation required in the plan.

- **Dinosaur to Hunt 12kV/69kV Transmission Line, Arizona - Salt River Project.** Supervision of the mitigation of prehistoric Native American houses and canals .
- **Palo Verde to Pinal West 500 kV Transmission Line, Arizona - Salt River Project.** Supervision of the mitigation of the Gillespie Dam Site, a large prehistoric Native American village.
- **Abel 230/69kV Substation, Queen Creek, Arizona - Salt River Project.** Lead staff on cultural resources assessment of proposed Abel Substation. Part of planning for a new double-circuit 230kV transmission line connecting two SRP-owned and previously sited sites to serve developing areas in and around Queen Creek.

University of New Mexico

2000-2002, 2005-2006

As Project Manager, lead a team of researchers studying prehistoric Native American architecture in northeastern Sonora, Mexico. Responsibilities included compliance with Mexican federal cultural resources law, research design, grant writing, report writing, budgeting and logistics, hiring and supervision of field and laboratory crew, negotiations with local land owners and politicians, data analysis and interpretation, public presentations, and publications.

Laboratory of Tree Ring Research, University of Arizona

2003-2004

As Project Manager, lead a team of researchers establishing a regional tree-ring chronology for northeastern Sonora, Mexico. Responsibilities included compliance with Mexican federal cultural resources law, supervision of field crew, negotiations with local land owners and politicians, research design, grant writing, report writing, budgeting, and logistics.

University of New Mexico

1999

As Project Manager, lead a team of researchers identifying prehistoric Native American sites in northeastern Sonora, Mexico. Responsibilities included compliance with Mexican federal cultural resources law, supervision of field crew, negotiations with local land owners and politicians, and grant writing.

Southwest Archaeological Consultants, New Mexico

1998

As a Field Supervisor, lead a team mitigating impacts to prehistoric Native American sites on coal mines in northeastern New Mexico.

University of New Mexico

1996, 1997

As a Field Supervisor, lead a team of researchers excavating late prehistoric Native American and early Spanish colonial sites in New Mexico.

BioSystems Analysis, Inc. - Santa Cruz, California

1992-1994

As a Lab Technician and Field Archaeologist, assisted with the mitigation of impacts to various prehistoric Native American sites along the central coast of California. Some of the field projects included:

- Fort Hunter-Liggett Cultural Resources On-Call
- Coastal Branch Phase II State Water Project
- Caltrans Highway 68 Rerouting, Fort Ord

MEMBERSHIPS

- Register of Professional Archaeologists
- Qualified Cultural Resources Project Manager – Arizona State Historic Preservation Office (AZ State Museum), 2008-2009
- Qualified Cultural Resources Project Manager – New Mexico State Historic Preservation Office, 2008-2009
- Society for American Archaeology
- Society for California Archaeology
- Arizona Archaeological Council
- Arizona Archaeological and Historical Society
- New Mexico Archaeological Council

HONORS AND AWARDS

- University of New Mexico Tom L. Popejoy Prize for most outstanding UNM dissertation, Domestic Architectural Production in Northwest Mexico, 2006
- National Science Foundation grant BCS-0210436: Expanding Dendroarchaeology into Northern Mexico, 2002
- National Science Foundation Dissertation Improvement Grant BCS-0121730, 2001

SELECTED PUBLICATIONS AND REPORTS

- Bagwell, Elizabeth A. 2008 Archaeological Data Recovery for the Dinosaur to Hunt 12kV/69kV Electric Line, Pinal County, Arizona. Technical Report No. 08-04. Desert Archaeology, Inc., Tucson, Arizona.
- Bagwell, Elizabeth A. 2008 Archaeological Monitoring for a Neighborhood Services Project at 922 E. Taylor, Phoenix, Arizona. Project Report No. 08-124. Desert Archaeology, Inc., Tucson, Arizona.
- Bagwell, Elizabeth A. 2008 Archaeological Monitoring at the Children's Museum of Phoenix, Maricopa County, Arizona. Project Report No. 08-123. Desert Archaeology, Inc., Tucson, Arizona.
- Bagwell, Elizabeth A. 2008 Cultural Resources Survey of 160 Acres North of the Abel Substation Site, Southeast of Queen Creek, Pinal County, Arizona. Project Report No. 08-114. Desert Archaeology, Inc., Tucson, Arizona.
- Bagwell, Elizabeth A. 2006 Domestic Architectural Production in Northwest Mexico. Ph.D. Dissertation, Department of Anthropology, University of New Mexico.
- Bagwell, Elizabeth A. 2004 Architectural Patterns Along the Rio Taraises, Northern Sierra Madre Occidental, Sonora. *Kiva* 70(1):7-30.
- Bagwell, Elizabeth A. 2003 The Production of Architectural Artifacts: An Analysis of Cliff-Dwellings in the Sierra Madre Occidental of Northwest Sonora, Mexico. 2001 Field Season. A report prepared for the Council of Archaeology of the National Institute of Anthropology and History (Informe al Consejo de Arqueología, Instituto Nacional de Antropología e Historia), Mexico City, Mexico.
- Bagwell, Elizabeth A. 2002 Ceramic Form and Skill: Attempting to Identify Child Producers at Pecos Pueblo, New Mexico. In *Children in the Prehistoric Puebloan Southwest*, pp. 90-107, edited by K. Kamp. University of Utah Press, Salt Lake City.
- Henderson, T. Kathleen and Elizabeth A. Bagwell 2007 Archaeological Treatment Plan for the Phoenix Sky Harbor International Airport Stage 1 Automated Train Project, Maricopa County, Arizona. Prepared for the City of Phoenix, PGM 2007-46. Desert Archaeology, Inc., Tucson.

- Ruscavage-Barz, Samantha and Elizabeth A. Bagwell 2006 *Gathering Spaces and Bounded Places: The Religious Significance of Plaza-Oriented Communities in the Northern Rio Grande, New Mexico*. In *Religion in the Prehispanic Southwest*, pp. 81-102, edited by C. S. VanPool, T. L. VanPool, and D. Phillips. Altamira Press, Lanham, Maryland.

RECENT PUBLIC OUTREACH AND PARTICIPATION IN PROFESSIONAL MEETINGS

- 2010 Co-Organizer and Co-Chair. Archaeology and Society. Session organized for the 11th Annual Southwest Symposium, Hermosillo, Sonora, Mexico. January 8-10, 2010. [With Cesar Villalobos.]
- 2008 Expecting the Unexpected: Recent Excavations at the Gillespie Dam Site. Poster presented at the Advances in Hohokam Archaeology Conference. Arizona Archaeological Council, Pueblo Grande Museum, Phoenix. October 24-25, 2008. [Senior author: T. Kathleen Henderson.]
- 2008 Hohokam Architecture During the Classic Period – What's Paquimé Got to Do With It? Paper presented at the 15th Biennial Mogollon Conference, Silver City, New Mexico. October 2-4, 2008.
- 2008 An Architectural Study of Cliff-Dwellings of the Sierra Madres, Sonora, Mexico. Invited public presentation for the Arizona Archaeological Society, Phoenix Chapter, Pueblo Grande Museum. April 10, 2008.
- 2008 Co-Organizer and Co-Chair. Recent Research in the Archaeology of Northwest Mexico. Symposium organized for the 73rd Annual Meeting of the Society for American Archaeology, Vancouver, B.C. March 26-30, 2008. [With Michael Mathiowetz.]
- 2008 Medio Period Colonization of the Northern Sierra of Northwest Mexico. Paper presented at the 73rd Annual Meeting of the Society for American Archaeology, Vancouver, B.C. March 26-30, 2008.
- 2008 Specialized Architectural Production: An Example from Northwest Mexico. Poster presented at the 20th Anniversary Southwest Symposium, Tempe, Arizona. January 17-19, 2008.

DECLARATION OF

George E. Kline

I, **George E. Kline**, declare as follows:

1. I am presently employed by the **Bureau of Land Management**, as an archaeologist.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I assisted in the preparation of the staff testimony on **Cultural Resources** for the Genesis Solar Energy Project, based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 09, 2010 Signed: _____

At: Palm Springs , California

CURRICULUM VITA

George E. Kline

U.S.D.O.I. Bureau of Land Management, California Desert District, Renewable Energy Coordinating Office (RECO), Palm Springs, California. 1201 Bird Center Dr. Palm Springs, CA 92262-8001
Phone: (760) 833-7135 E-mail: gkline@blm.gov

EDUCATION

M.A. Anthropology, San Diego State University, 2008

B.A. Anthropology, San Diego State University, 2005

CERTIFICATION AND PROFESSIONAL AFFILIATIONS

Member, Registry of Professional Archaeologists, since 2008.

Member, American Institute of Archaeology, since 2008.

Member, San Diego County Archaeological Society 2006 – 2009.

Member, San Bernardino County Museum, 2010

Member, Society for California Archaeology, 2006 – 2010

EMPLOYMENT HISTORY

| | | |
|------------------------|---|--|
| 01 – 2010 to Present | Archaeologist | USDOI Bureau of Land Management, California Desert District, Renewable Energy Coordinating Office (RECO), Palm Springs, CA |
| 08 – 2008 to 12 – 2009 | Archaeologist | USDA San Bernardino National Forest, Mountaintop Ranger District, Skyforest, CA. |
| 11 – 1995 to 02-2005 | Marine Electrician and Anthropology Student | General Dynamics NASSCO, San Diego, CA. Electrical Department |
| 02 – 2005 to 08-2008 | Employee Advisor Anthropologist | General Dynamics NASSCO, San Diego, CA. Human Resources, Training Department |
| 04 – 1991 to 10 - 1995 | Archaeological Technician | USDA Modoc National Forest, Doublehead Ranger District, Tulelake, CA |

PUBLICATIONS

Books/Monographs

Kline, George E. and Victoria L. Kline

- 2007 Fluted Point Recovered From San Diego County Excavation. In *Proceedings of the Society for California Archaeology*, Vol. 20, 2007, pp. 55–59

Kline, George Evan

- 2008 *Metates to Merit Badges: The Contrasting Occupational Sequences of Lost Valley*.
Master's Thesis, Anthropology Department, San Diego State University, San Diego, CA.

Kline, George E.

- 2009 An Intensive Archaeological Reconnaissance of the Corridor of Forest Service Road 3N34, Miller Canyon, Mountaintop Ranger District, San Bernardino National Forest, California.

Kline, George E.

- 2009 An Intensive Archaeological Reconnaissance of the Corridor of Forest Service Road 3N16, Big Pine Flat, Mountaintop Ranger District, San Bernardino National Forest, California.

Kline, George E.

- 2009 An Intensive Archaeological Reconnaissance of the Corridor of Forest Service Roads for the American Recovery and Reinvestment Act.(ARRA), Mountaintop Ranger District, San Bernardino National Forest, California.

DECLARATION OF
Alvin J. Greenberg, Ph.D.

I, **Alvin J. Greenberg, Ph.D.** declare as follows:

1. I am presently a consultant to the California Energy Commission, Energy Facilities Siting and Environmental Protection Division.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on the **Public Health, Hazardous Materials Management, and Worker Safety/Fire Protection** sections for the **Genesis Solar Energy Project Application** based on my independent analysis of the amendment petition, supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____

Signed: _____

At: Sacramento, California

Risk Science Associates

121 Paul Dr., Suite A, San Rafael, Ca. 94903-2047

415-479-7560 fax 415-479-7563

e-mail agreenberg@risksci.com

Name & Title:

Alvin J. Greenberg, Ph.D., FAIC, REA, QEP
Principal Toxicologist

Dr. Greenberg has had over two decades of complete technical and administrative responsibility as a team leader in the preparation of human and ecological risk assessments, air quality assessments, hazardous materials handling and risk management/prevention, infrastructure vulnerability assessments, occupational safety and health, hazardous waste site characterization, interaction with regulatory agencies in obtaining permits, and conducting lead surveys and studies. He has particular expertise in the assessment of dioxins, lead, diesel exhaust, petroleum hydrocarbons, mercury, the intrusion of subsurface contaminants into indoor air, and the preparation and review of public health/public safety sections of EIRs/EISs. Dr. Greenberg's expertise in risk assessment has led to his appointment as a member of several state and federal advisory committees, including the California EPA Advisory Committee on Stochastic Risk Assessment Methods, the US EPA Workgroup on Cumulative Risk Assessment, the Cal/EPA Peer Review Committee of the Health Risks of Using Ethanol in Reformulated Gasoline, the California Air Resources Board Advisory Committee on Diesel Emissions, the Cal/EPA Department of Toxic Substances Control Program Review Committee, and the DTSC Integrated Site Mitigation Committee. Dr. Greenberg is the former Chair of the Bay Area Air Quality Management District Hearing Board, a former member of the State of California Occupational Health and Safety Standards Board (appointed by the Governor), and former Assistant Deputy Chief for Health, California OSHA. And, since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments, power plant security programs, and conducting safety and security audits of power plants for the California Energy Commission and has assisted the CEC in the assessment of safety and security issues for proposed LNG terminals. In addition to providing security expertise to the State of California, Dr. Greenberg was the Team Leader and main consultant to the State of Hawaii on the updating of their Energy Emergency Preparedness Plan.

Years Experience: 26

Education:

B.S. 1969 Chemistry, University of Illinois Urbana

Ph.D. 1976 Pharmaceutical/Medicinal Chemistry, University of California, San Francisco

Postdoctoral Fellowship 1976-1979 Pharmacology/Toxicology, University of California, San Francisco

Postgraduate Training 1980 Inhalation Toxicology, Lovelace Inhalation Toxicology Research Institute, Albuquerque, NM

Professional Registrations:

Board Certified as a Qualified Environmental Professional (QEP)
California Registered Environmental Assessor - I (REA)
Fellow of the American Institute of Chemists (FAIC)

Professional Affiliations:

Society for Risk Analysis
Air and Waste Management Association
American Chemical Society
American Association for the Advancement of Science
National Fire Protection Association

Technical Boards and Committee Memberships - Present:

Squaw Valley Technical Review Committee
(appointed 1986)

Technical Boards and Committee Memberships - Past:

July 1996 – March 2002

Member, Bay Area Air Quality Management District Hearing Board
(Chairman 1999-2002)

September 2000 – February 2001

Member, State Water Resources Control Board Noncompliant Underground
Tanks Advisory Group

January 1999 – June 2001

Member, California Air Resources Board Advisory Committee on Diesel
Emissions

January 1994 - September 1999

Vice-Chairman, State Water Resources Control Board Bay Protection and Toxic
Cleanup Program Advisory Committee

September 1998

Member, US EPA Workgroup on Cumulative Risk Assessment

April 1997 - September 1997

Member, Cal/EPA Private Site Manager Advisory Committee

January 1986 - July 1996

Member, Bay Area Air Quality Management District Advisory Council
(Chairman 1995-96)

January 1988 - June 1995

Member: California Department of Toxic Substance Control Site Mitigation
Program Advisory Group

January 1989 - February 1995

Member: Department of Toxics Substances Control Review Committee, Cal-EPA

October 1991 - February 1992

Chair: Pollution Prevention and Waste Management Planning Task Force of the
Department of Toxics Substances Control Review Committee, Cal-EPA

September 1990 - February 1991

Member: California Integrated Waste Management Board Sludge Advisory
Committee

September 1987 - September 1988

ABAG Advisory Committee on Regional Hazardous Waste Management Plan

March 1987 - September 1987

California Department of Health Services Advisory Committee on County and
Regional Hazardous Waste Management Plans

January 1984 - October 1987

Member, San Francisco Hazardous Materials Advisory Committee

March 1984 - March 1987

Member, Lawrence Hall of Science Toxic Substances and Hazardous Materials
Education Project Advisory Board

Jan. 1, 1986 - June 1, 1986

Member, Solid Waste Advisory Committee, Governor's Task Force on Hazardous
Waste

Jan. 1, 1983 - June 30, 1985

Member, Contra Costa County Hazardous Waste Task Force

Sept. 1, 1982 - Feb. 1, 1983

Member, Scientific Panel to Address Public Health Concerns of Delta Water
Supplies, California Department of Water Resources

Present Position

January 1983- present

Owner and principal with Risk Sciences Associates, a Marin County, California,
environmental consulting company specializing in multi-media human health and
ecological risk assessment, air pathway analyses, hazardous materials management-
infrastructure security, environmental site assessments, review and evaluation of
EIRs/EISs, preparation of public health and safety sections of EIRs/EISs, and litigation
support for toxic substance exposure cases.

Previous Positions

Jan. 2, 1983 - June 12, 1984

Member, State of California Occupational Safety and Health Standards Board
(Cal/OSHA), appointed by the Governor

Aug. 1, 1979 - Jan. 2, 1983

Assistant Deputy Chief for Health, California Occupational Safety and Health
Administration

Feb. 1, 1979 - Aug. 1, 1979

Administrative Assistant to Chairperson of Finance Committee, Board of Supervisors, San Francisco

Jan. 1, 1976 - Feb. 1, 1979

Research Pharmacologist and Postdoctoral Fellow, Department of Pharmacology and Toxicology, School of Medicine, University of California, San Francisco

Jan. 1, 1975 - Dec. 31, 1975

Acting Assistant Professor, Department of Pharmaceutical Chemistry, University of California, San Francisco

Experience

General

Dr. Greenberg has been a consultant in Hazardous Materials Management and Security, Human and Ecological Risk Assessment, Occupational Health, Toxicology, Hazardous Waste Site Characterization, and Toxic Substances Control Policy for over 26 years. He has broad experience in the identification, evaluation and control of health and environmental hazards due to exposure to toxic substances. His experience includes Community Relations Support and Risk Communication through experience at high-profile sites and presentations at professional society meetings.

He has considerable experience in the review and evaluation of exposure via the air pathway - particularly to emissions from power plants, refineries, and diesel exhaust - and a thorough knowledge of the regulatory requirements through his experience at Cal/OSHA, the BAAQMD Hearing Board, as a consultant to the California Energy Commission, and in preparing such assessments for local government and industry. He has assessed exposures to diesel exhaust during construction and operations of stationary and mobile sources and has testified at evidentiary hearings numerous times on this subject.

He is presently assisting the California Energy Commission in assessing the risks to workers and the public of proposed power plants and LNG terminals in the state. His experience in hazard identification, exposure assessment, risk assessment, occupational safety and health, emergency response, and Critical Infrastructure Protection has made him a valuable part of the CEC team addressing this issue. He has reviewed and commented on the DEIS/DEIR for the proposed SES LNG Port of Long Beach terminal, focusing on security issues for the CEC and on safety matters for the City of Long Beach. He has presented technical information and analysis to the State of California Interagency LNG Working Group on thermal radiation public exposure criteria and safety/security at an east coast urban LNG terminal. (Both presentations are confidential owing to the nature of the material.) He has conducted numerous evaluations of the safety and hazards of natural gas pipelines for the CEC and has presented his findings and recommendations at public meetings and evidentiary hearings.

He served for over five years as the Vice-chair of the California State Water Resources Control Board Advisory Committee convened to address toxic substances in sediments in bays, rivers, and estuaries. He has been a member of the Squaw Valley Technical Review Committee since 1986 establishing chemical application management plans at golf courses to protect surface and

groundwater quality. He has also conducted numerous ecological risk assessments and characterizations, including those for marine and terrestrial habitats.

Dr. Greenberg has extensive experience in data collection and preparation of human and ecological risk assessments on numerous military bases and industrial sites with Cal/EPA DTSC and RWQCB oversight. He has also been retained to provide technical services to the Cal/EPA Department of Toxic Substances Control (preparation of human health risk assessments) and the Office of Environmental Health Hazard Assessment (review and evaluation of air toxics health risk assessments and preparation of profiles describing the acute and chronic toxicity of toxic air contaminants). He has also conducted several surveys of sites containing significant lead contamination from various sources including lead-based paint, evaluated potential occupational exposure to lead dust and fumes in industrial settings, prepared numerous human health risk assessments of lead exposure, and prepared safety and health plans for remedial investigation of lead contaminated soils. Dr. Greenberg is also a recognized expert on the requirements of California's Proposition 65 and has served as an expert on Prop. 65 litigation.

Liquefied Natural Gas (LNG)

Dr. Greenberg assisted the CEC in the preparation of the "background" report on the risks and hazards of siting LNG terminals in California ("LNG in California: History, Risks, and Siting" July 2003) and consulted for the City of Vallejo on a proposed LNG terminal and storage facility at the former Mare Island Naval Shipyard. He has also conducted an evaluation and prepared comments on the risks, hazards, and safety analysis of the DEIS/DEIR for the City of Long Beach on a proposed LNG terminal at the Port of Long Beach (POLB) and conducted an analysis on vulnerability and critical infrastructure security for the CEC on this same proposed LNG terminal. He currently advises the CEC on the POLB LNG proposal on risks, hazards, human thresholds of thermal exposure, vulnerability, security, and represented the CEC at a U.S. Coast Guard briefing on the Waterway Suitability Assessment that included the sharing of SSI (Sensitive Security Information). He has presented technical information and analysis to the State of California LNG Interagency Working Group on thermal radiation public exposure criteria and safety/security at an east coast urban LNG terminal. (Both presentations are confidential owing to the nature of the material.) He has conducted numerous evaluations of the safety and hazards of natural gas pipelines for the CEC and has presented his findings and recommendations at public meetings and evidentiary hearings.

Infrastructure Security

Since 2002, Dr. Greenberg has been trained by and is working with the Israeli company SB Security, LTD, the most experienced and tested security planning and service company in the world. Since the events of 9/11, Dr. Greenberg has been the lead person for developing vulnerability assessments and power plant security programs for the California Energy Commission (CEC). In taking the lead for this state agency, Dr. Greenberg has interfaced with the California Terrorism Information Center (CATIC) and provided analysis, recommendations, and testimony at CEC evidentiary hearings regarding the security of power plants within the state. These analyses include the assessment of Critical Infrastructure Protection, threat assessments, criticality assessments, and the preparation of vulnerability assessments and off-site consequence analyses addressing the use, storage, and transportation of hazardous materials, recommendations for security to reduce the threat from foreign and domestic terrorist activities, perimeter security, site access by personnel and vendors, personnel background checks,

management responsibilities for facility security, and employee training in security methods. Dr. Greenberg is the lead person in developing a model power plant security plan, vulnerability assessment matrix, and a security training manual for the CEC. The model security plan is used by power plants in California as guidance in developing and implementing security measures to reduce the vulnerability of California's energy infrastructure to terrorist attack. He has testified at several evidentiary hearings for the CEC on power plant security issues. He also leads an audit team conducting safety and security audits at power plants throughout California that are under the jurisdiction of the CEC. In addition to providing security expertise to the State of California, in August 2004, a team of experts led by Dr. Greenberg was awarded an 18-month contract by the State of Hawaii to update and improve the state's Energy Emergency Preparedness Plan and make recommendations for increased security of critical energy infrastructure on this isolated group of islands.

Air Pathway Analysis

Dr. Greenberg has prepared numerous Air Pathway Analyses and human health risk assessments, evaluating exposure at numerous locations in California, Hawai'i, Oregon, Minnesota, Michigan, and New York. He is experienced in working with Region IX EPA, the State of California DTSC, and the Hawai'i Department of Health Clean Air Branch in the application of both site-specific and non site-specific health risk assessment criteria.

Examples

Human Health Risk Assessment for the Open Burn/Open Detonation Operation at McCormick Selph, Inc., Hollister, Ca. (June 2003)

Air Quality and Human Health Risk Assessment for the Royal Oaks Industrial Complex, Monrovia, Ca. (January 2003)

Human Health Risk Assessment and Indoor Vapor Intrusion Assessment for the former Pt. St. George Fisheries Site, Santa Rosa, Ca. (October 2002)

Human Health Risk Assessment for the former Sargent Industries Site, Huntington Park, Ca. (July 2001)

Ballard Canyon Air Pathway Analysis and Human Health Risk Assessment, Santa Barbara County, Ca. (September 2000)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca. (March, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawai'i (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawai'i Office of Space Industry (March 1993)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

Cancer Risk Assessment for the H-Power Generating Station, Campbell Industrial Park, Oahu, Hawai'i (1988)

Hazardous Materials Assessments, Waste Management Assessments, Worker Safety and Fire Protection Assessments, and Public Health Impacts Assessments

Dr. Greenberg also has significant experience as a consultant and expert witness for the California Energy Commission providing analysis, recommendations, and testimony in the areas of hazardous materials management, process safety management, waste management, worker safety and fire protection, and public health impacts for proposed power plant/cogeneration facilities. These analyses include the evaluation and/or preparation of the following:

- Off-site consequence analyses of the handling, use, storage, and transportation of hazardous materials,
- Risk Management Plans (required by the Cal-ARP) and Business Plans (required by H&S Code section 25503.5),
- Safety Management Plans (required by 8 CCR section 5189),
- Natural gas pipeline safety,
- Solid and hazardous waste management plans,
- Phase I and II Environmental Site Assessments,
- Construction and Operations Worker Safety and Health Programs,
- Fire Prevention Programs,
- Human health risk assessment from stack emissions and from diesel engines, and
- Mitigation measures to address PM exposure, including diesel particulates

Examples

- San Francisco Energy Reliability Project, San Francisco, Ca. 2004-present. Hazardous materials management, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Malburg Generating Station Project, City of Vernon, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Blythe II, Blythe, Ca. 2002-3. hazardous materials, worker safety/fire protection,
- Palomar Energy Center, Escondido, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Project, Rancho Seco, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Project, Tesla, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management, public health
- San Joaquin Valley Energy Center, San Joaquin, Ca. 2002-3. hazardous materials, worker safety/fire protection, waste management
- Morro Bay Power Plant, Morro Bay, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Potrero Power Plant Unit 7, San Francisco, Ca., 2001-2: hazardous materials, worker safety/fire protection
- El Segundo Power Redevelopment Project, El Segundo, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Rio Linda Power Project, Rio Linda, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Pastoria II Energy Facility Expansion, Grapevine, Ca., 2001: hazardous materials, worker safety/fire protection
- East Altamont Energy Center, Byron, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Magnolia Power Project, Burbank, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Russell City Energy Center, Hayward, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management
- Woodbridge Power Plant, Modesto, Ca., 2001: hazardous materials, worker safety/fire protection, waste management
- Colusa Power Plant Project, Colusa County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Valero Refinery Cogeneration Project, Benicia, Ca., 2001: hazardous materials, worker safety/fire protection
- Ocotillo Energy Project, Palm Springs, Ca., 2001: hazardous materials, worker safety/fire protection
- Gilroy Energy Center Phase II Project, Gilroy, Ca., 2001-2: hazardous materials, worker safety/fire protection
- Los Esteros Critical Energy Facility, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Roseville Energy Facility, Roseville, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health

- Spartan Power, San Jose, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Inland Empire Energy Center, Romoland, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- South Star Cogeneration Project, Taft, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tesla Power Plant, Eastern Alameda County, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Tracy Peaker Project, Tracy, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Henrietta Peaker Project, Kings County, Ca., 2001: hazardous materials, worker safety/fire protection, waste management, public health
- Central Valley Energy Center, San Joaquin, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Cosumnes Power Plant, Rancho Seco, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Los Banos Voltage Support Facility, Western Merced County, Ca., 2001-2: waste management, public health
- Palomar Energy Project, Escondido, Ca., 2001-2: hazardous materials, worker safety/fire protection, waste management, public health
- Metcalf Energy Center, San Jose, Ca., 2000-1: hazardous materials
- Blythe Power Plant, Blythe, Ca., 2000-1: hazardous materials
- San Francisco Energy Co. Cogeneration Project, San Francisco, Ca., 1994-5: hazardous materials
- Campbell Soup Cogeneration Project, Sacramento, Ca., 1994: hazardous materials
- Proctor and Gamble Cogeneration Project, Sacramento, Ca., 1993-4: hazardous materials
- San Diego Gas and Electric South Bay Project, Chula Vista, Ca., 1993: hazardous materials
- SEPCO Project, Rio Linda, Ca., 1993: hazardous materials
- Shell Martinez Manufacturing Complex Cogeneration Project, Martinez, Ca., 1993: hazardous materials and review and evaluation of EIR
- SFERP Project, San Francisco, Ca. 2004 – 2006. hazardous materials, worker safety/fire protection, waste management, public health

Occupational Safety and Health/Health and Safety Plans/Indoor Air Quality

Dr. Greenberg has significant experience in occupational safety and health, having directed the development, adoption, and implementation of over 50 different Cal/OSHA regulations, including airborne contaminants (>450 substances), lead, asbestos, confined spaces, and worker-right-to-know (MSDSs). He has conducted numerous occupational health surveys and has extensive experience in the sampling and analysis of indoor air quality at residences, workplaces, and school classrooms. He is currently the team leader conducting safety and security audits at power plants throughout California for the California Energy Commission. Safety issues audited include compliance with regulations addressing several safety matters, including but not limited to, confined spaces, lockout/tagout, hazardous materials, and fire prevention/suppression equipment.

Examples

Review and Evaluation of Public and Worker Safety Issues at the proposed SES LNG Facility, Port of Long Beach. prepared for the City of Long Beach. (November 2005)

Confidential safety and security audit reports for 18 power plants in California. prepared for the California Energy Commission. (January 2005 through March 2006)

Report on the Accidental release and Worker Exposure to Anhydrous Ammonia at the BEP I Power Plant, Blythe, Ca. prepared for the California Energy Commission. (October 2004)

Investigation of a Worker Death in a Confined Space, La Paloma Power plant. prepared for the California Energy Commission. (July 2004)

Preliminary Report on Indoor Air Quality in Elementary School Portable Classrooms, Marin County, Ca. (December 1999)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Air Pathway Analysis for the Ballard Canyon Landfill. Submitted to the County of Santa Barbara, (March 1999)

Review and Evaluation of the Health Risk Assessment for Outdoor and Indoor Exposures at the Former Golden Eagle Refinery Site, Carson, Ca. (May 1998)

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Determination of Occupational Lead Exposure at a Tire Shop in Placerville, Ca. (April 1993)

Development of an Environmental Code of Regulations for Hazardous Waste Treatment Facilities on La Posta Indian Tribal lands, San Diego County, Ca. (August 1992)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Sites with RWQCB and/or DTSC Oversight

Dr. Greenberg has specific experience in assessing human health and ecological risks at contaminated sites at the land/water interface, including petroleum contaminants, metals, mercury, and VOCs at several locations in California including Oxnard, Richmond, Avila Beach, Mare Island Naval Shipyard, San Diego, Hollister, San Francisco, Hayward, Richmond, the Port of San Francisco, and numerous other locations. He has used Cal/EPA methods, US EPA

methods, and ASTM Risk Based Corrective Action (RBCA) and Cal/Tox methodologies. He is extremely knowledgeable about SWRCB and SF Bay RWQCB regulations on underground storage tank sites and with ecological issues presented by contaminated sediments including sediment analysis, toxicity testing, tissue analysis, and sediment quality objectives. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Dr. Greenberg experience on many of these contaminated sites has been as a consultant to local governments, state agencies, and citizen groups. He assisted the City and County of San Francisco in developing local ordinance requiring soil testing (Article 20, Maher ordinance) and hazardous materials use reporting (Article 21, Walker ordinance). He served as the City of San Rafael's consultant to provide independent review and evaluation of the site characterization and remedial action plan prepared for a former coal gasification site. He was a consultant to a citizen group in northern California regarding exposure and risks due to accidental releases from a petroleum refinery and assisted in the assessment of risks due to crude petroleum contamination of a southern California beach. He has prepared a number of risk assessments addressing crude petroleum, diesel and gasoline contamination, including coordinating site investigations, environmental monitoring, and health risk assessment for the County of San Luis Obispo regarding Avila Beach subsurface petroleum contamination. That high-profile project lasted for over one year and Dr. Greenberg managed a team of experts with a budget of \$750,000. Another high-profile project included the preparation of an extensive comprehensive human and ecological risk assessment for the Hawaii Office of Space Industry on rocket launch impacts and transportation/storage of rocket fuels at the southern end of the Big Island of Hawaii. Dr. Greenberg's risk assessments were part of the EIS for the project. Dr. Greenberg also worked on another high-profile project conducting Air Pathway Analysis of off-site and on-site impacts from landfill gas constituents, including indoor and outdoor air measurements, air dispersion modeling, flux chamber investigations, and health risk assessment for the County of Santa Barbara. Dr. Greenberg has conducted RI/FS work, prepared health risk assessments, evaluated hazardous waste sites and hazardous materials use at numerous locations in California, Hawaii, Oregon, Minnesota, Michigan, and New York. He has considerable experience in the development of clean-up standards and the development of quantitative risk assessments for site RI/FS work at CERCLA sites, as well as site closures, involving toxic substances and petroleum hydrocarbon wastes. He is experienced in working with both Region IX EPA and the State of California DTSC in negotiating clean-up standards based on the application of both site-specific and non site-specific health and ecological based clean-up criteria. He has significant experience in the development of site chemicals of concern list, quantitative data quality levels, site remedial design, the site closure process, the design and execution of data quality programs and verification of data quality prior to its use in the decision making process on large NPL sites.

Examples

The Avila Beach Health Study Phase 1: Reconnaissance Sampling Findings, Conclusions, and Recommendations. (July 1997) Volume 1: Baseline Human Health Risk Assessment. (May 1998)

The Avila Beach Health Study Phase 1, Volume 2: Environmental Monitoring. (May 1998)

Health Risk Assessment and Air Pathway Analysis for the Ballard Canyon Landfill, Santa Barbara County, Ca. (March 1999)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment Due to Diesel Train Engine Emissions, Oakland, Ca. (June 1999)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Phase 2 Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (February 1997)

Human Health Risk Assessment, Teledyne Ryan Aeronautical, McCormick Selph Ordnance. Hollister, California. (December 1996)

Initial Phase Human Health Risk Assessment, Teledyne Inc., San Diego, Ca. (October 1996)

Human Health Risk Assessment, Ecological Screening Evaluation, and Development of Proposed Remediation Goals for the Flair Custom Cleaners Site, Chico, California (January 1996)

Human Health Risk Assessment for the X-3 Extrudate Project at Criterion Catalyst, Pittsburg, Ca. (November 1994)

Screening Health Risk Assessment and Development of Proposed Soil Remediation Levels at Hercules Plant #3, Culver City, Ca. (July 1993)

Ecological Screening Evaluation for the Altamont Landfill, Alameda County, Ca. (June, 1993)

Focused Ecological Risk Characterization, Hawaiian Electric Company, Keahole Generating Station Expansion, Hawaii (June 1993)

Human Health Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (April 1993)

Ecological Risk Assessment for the Proposed Palima Point Space Launch Complex, prepared for the Hawaii Office of Space Industry (March 1993)

Human Health Risk Assessment for Current and Proposed Expanded Class II and Class III Operations at the Altamont Sanitary Landfill, Alameda County, Ca. (March, 1993)

Screening Health Risk Assessment for the Proposed Expansion of the West Marin Sanitary Landfill, Point Reyes Station, Ca. (March, 1993)

Health Risk Assessment for the Proposed Expansion of the Forward, Inc. Landfill, Stockton, Ca. (September 14, 1992)

Health Risk Assessment for the Rincon Point Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency. (August 10, 1992)

Health Risk Assessment for the South Beach Park Project, San Francisco, Ca. Prepared for Baseline Environmental Consulting and the San Francisco Redevelopment Agency. (August 10, 1992)

Screening Health Risk Assessment and Development of Proposed Soil and Groundwater Remediation Levels, Kaiser Sand and Gravel, Mountain View, Ca. Prepared for Baseline Environmental Consulting (January 30, 1992)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Preliminary Health Risk Assessment for the City of Pittsburg Redevelopment Agency, Pittsburg, California (May 29, 1991)

Military Bases

Dr. Greenberg has experience in conducting assessments at DOD facilities, including RI/FS work, preparation of health risk assessments, evaluation of hazardous waste sites and hazardous materials use at the following Navy sites in California: San Diego Naval Base; Marine Corps Air-Ground Combat Center, 29 Palms; Mare Island Naval Shipyard, Vallejo; Treasure Island Naval Station, San Francisco, Hunters Point Naval Shipyard, San Francisco, and the Marine Corps Logistics Base, Barstow. He worked with the U.S. Navy and the U.S. EPA in the implementation of Data Quality Objectives (DQO's) at MCLB, Barstow.

Examples

Review and Evaluation of the Remedial Investigation Report and Human Health Risk Assessment for the U. S. Naval Station at Treasure Island, Ca. (June 1999)

Screening Health Risk Assessment for the Proposed San Francisco Police Department's Helicopter Landing Pad at Hunters Point Shipyard, San Francisco, Ca. (September 1997)

Development of Proposed Soil Remediation Levels for the Marine Corps Air-Ground Combat Center, 29 Palms, California (May 30, 1991)

Health Risk Assessment for the Chrome Plating Facility, Mare Island Naval Shipyard, Vallejo, California (October 24, 1988)

Background Levels and Health Risk Assessment of Trace Metals present at the Naval Petroleum Reserve No.1, 27R Waste Disposal Trench Area, Lost Hills, California (August 12, 1988)

RCRA Facility Investigation (RFI) Work Plan of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 14, 1989)

Hazardous Waste and Solid Waste Audit and Management Plan, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (July 3, 1989)

Water Quality Solid Waste Assessment Test (SWAT) Proposal RCRA Landfill, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (October 31, 1988)

Waste Disposal Facilities, Waste Haulers, Waste Recycling Facilities Report, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 22, 1988)

Sampling and Analysis Plan, Health and Safety Plan, Site Characterization of Lead Oxide Contaminated Areas, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (September 2, 1988)

Air Quality Solid Waste Assessment Test (SWAT) Proposal, Mare Island Naval Shipyard, Vallejo, California. Prepared in conjunction with Kaman Sciences Corp. (August 25, 1988)

Mercury Contamination

Dr. Greenberg has prepared and/or reviewed several human health and ecological risk assessments regarding mercury contamination in soils, sediments, and indoor surfaces. Dr. Greenberg served on the State Water Resources Control Board Bay Protection and Toxic Cleanup Program Advisory Committee from 1994 until the end of the program in 1999.

Examples

Review and evaluation of a human health risk assessment of ingestion of sport fish caught from San Diego Bay and which contain tissue levels of mercury and PCBs (November 2004 – present)

Screening Human Health Risk Assessment, Calculation of Soil Clean-up Levels, and Aquatic Ecological Screening Evaluation, Galilee Harbor, Sausalito, Ca. (May 1998)

Health Risk Assessment for Residual Mercury at the Deer Creek Facility, 3475 Deer Creek Road, Palo Alto, California. (July 1997)

Human Health Risk Assessment Due to Emissions from a Medical Waste Incinerator, prepared for Kauai Veterans Memorial Hospital, Kauai, Hawai'i (1994)

DECLARATION OF Testimony of Negar Vahidi

I, **Negar Vahidi**, declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Siting, Transmission and Environmental Protection Division, as a **Senior Project Manager/Senior Land Use Technical Specialist**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared the staff testimony on **Land Use** for the **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 23, 2010 Signed: _____

At: Agoura Hills, California



NEGAR VAHIDI

Senior Associate

Land Use, Policy Analysis, and Socioeconomics

ACADEMIC BACKGROUND

Master of Public Administration, University of Southern California, 1993

B.A. (with Highest Honors), Political Science, University of California, Irvine, 1991

PROFESSIONAL EXPERIENCE

Ms. Vahidi is an environmental planner with over 15 years of experience managing and preparing a variety of federal and State of California environmental, planning, and analytical documents for large-scale infrastructure and development projects. Ms. Vahidi brings the experience of being both a public and private sector planner, specializing in the integration and completion of NEPA and CEQA documentation, joint documentation, land use, socioeconomic, and public policy analysis, environmental justice analysis, and public and community involvement programs. Her diversity and experience in preparing NEPA, CEQA, and NEPA/CEQA joint documentation can be shown through a sample of her projects.

Aspen Environmental Group

1992 to 1998 and 2001 to present

Ms. Vahidi has participated in CEQA and NEPA analyses of major utility development projects, providing public policy and land use expertise as well as managing Public Participation Programs. She has conducted land use analyses for major environmental assessments, including identification of ownership and land use types and identification of sensitive land uses and sensitive receptors. She has also gathered and analyzed information on State, federal and local laws, policies and regulations relevant to land uses and public policy. Her specific projects are described below.

- **TANC Transmission Project (TTP), several Northern California Counties.** Ms. Vahidi is currently serving as the Deputy Project Manager in charge of preparation of the EIR/EIS and guiding the CEQA/NEPA analysis. The Transmission Agency of Northern California (TANC) and Western Area Power Administration (Western), an agency of the U.S. Department of Energy (DOE), are the CEQA lead agency and NEPA lead agency, respectively. The TTP generally would consist of approximately 600 miles of new and upgraded 500 kilovolt (kV) and 230 kV transmission lines, substations, and related facilities generally extending from northeastern California near Ravendale in Lassen County to the California Central Valley through Sacramento and Contra Costa Counties and westward into the San Francisco Bay Area. Ms. Vahidi worked with TANC and Western to initiate the scoping process, including preparation of the NOP, preparing for scoping meetings, frameworking the EIR/EIS document, etc. She also led the preparation of the project scoping report.
- **Littlerock Reservoir Sediment Removal Project EIS/EIR, Palmdale, CA.** Ms. Vahidi is the Project Manager for this joint EIS/EIR evaluating the impacts of sediment removal alternatives for the Littlerock Reservoir and Dam on USFS Angeles National Forest (NEPA Lead Agency) lands in Los Angeles County. The Palmdale Water District (District) [CEQA Lead Agency] proposes to remove approximately 540,000 cubic yards of sediment from the reservoir (behind the dam) and haul it to off-site commercial gravel pits located 6 miles north of the dam site in the community of Littlerock. The project involves impacts to the arroyo toad, extensive coordination with USFWS for a Section 7 consultation, incorporation of new Forest Service Plan updates and requirements into the

analysis, preparation of the Forest Service required BE/BA, and analysis of compliance with federal air quality conformity requirements. Under Ms. Vahidi's direction, Aspen developed six different project alternatives for sediment removal, involving detailed hydraulics analysis and preparation of a hydraulics technical report. The most feasible of these alternatives (grade control structure) was chosen by the PWD as their proposed project to be evaluated in the EIS/EIR. In addition, the PWD is currently considering an additional alternative (use of a slurry line for sediment removal) presented by Aspen. Aspen is currently working on the Administrative Draft EIR/EIS and assisting the PWD with portions of their Proposition 50 grant application to the DWR.

- **El Casco System Project, Riverside, CA.** Ms. Vahidi is serving as the Project Manager for this EIR being prepared for the CPUC to evaluate SCE's application for a Permit to Construct (PTC) the El Casco System Project. The Proposed Project would be located in a rapidly growing area of northern Riverside County, which includes the Cities of Beaumont, Banning, and Calimesa. A 115 kV subtransmission line begins at Banning Substation and extends westward toward the proposed El Casco Substation site within the existing Banning to Maraschino 115 kV subtransmission line and Maraschino–El Casco 115 kV subtransmission line ROWs. Major issues of concern include impacts to existing and residential land uses, which have led to the development of a partial underground alternative and a route alternative different than the project route proposed by SCE (the Applicant). The 1,200-page Draft EIR was released for a 45-day public review and comment on December 12, 2007, and evaluates project alternatives at the same level of detail as the Proposed Project analysis.
- **Sacramento Area Voltage Support Supplemental Environmental Impact Statement (SEIS), Western Area Power Administration.** Ms. Vahidi served as the task leader for several social science sections for the SEIS for a double-circuit 230 kV circuit between Western's O'Banion/Sutter Power Plant and Elverta Substation/Natomas Substation. New transmission lines and transmission upgrades are needed to mitigate transmission line overload, reduce the frequency of automatic generation and load curtailment during the summer peak load periods, and help maintain reliability of the interconnected system operation. Ms. Vahidi directed the preparation of the land use, aesthetics, socioeconomics, and environmental justice sections of the SEIS.
- **Sunset Substation and Transmission and Distribution Project CEQA Documentation, Banning, CA.** The City of Banning proposes to construct the Sunset Substation and supporting 33-kilovolt (kV) transmission line that would interconnect with the City's existing distribution system. The purpose of this new substation and transmission is to relieve the existing overloads that are occurring within the City's electric system and to accommodate projected growth in the City. Ms. Vahidi served as the Environmental Project Manager for the initial stages of CEQA documentation prepared for the City's Utility Department.
- **San Onofre Nuclear Generating Station (SONGS) Steam Generator Replacement Project, San Clemente, CA.** Ms. Vahidi served as the Technical Senior in charge of developing the methodology and guiding the analysis for the Land Use and Recreation Section of this EIR. This project EIR addressed the environmental effects of SCE's proposed replacement of Steam Generator Units 2 & 3 at the SONGS Nuclear Power Plant located entirely within the boundaries of the U.S. Marine Corps Base Camp (MCBCP) Pendleton. Issues of concern included potential conflicts resulting from the transport of the large units through sensitive recreation areas such as beaches, and the San Onofre State Park.
- **Diablo Canyon Power Plant (DCPP) Steam Generator Replacement Project, San Luis Obispo County, CA.** Ms. Vahidi served as the Technical Senior in charge of developing the methodology and guiding the analysis for the Land Use and Recreation Section of this EIR. The EIR addressed impacts associated with the replacement of the eight original steam generators (OSGs) at DCPP Units 1 and 2 due to degradation from stress and corrosion cracking, and other maintenance difficulties. The Proposed Project would be located at the DCPP facility, which occupies 760 acres within PG&E's 12,000-acre owner-controlled land on the California coast in central San Luis Obispo County. Land

use issues of concern include impacts to agricultural lands, recreational resources, and potential Coastal Act inconsistencies.

- **Cabrillo Port Liquefied Natural Gas (LNG) Deepwater Port, Ventura County, CA.** Under contract to the City of Oxnard, Aspen was tasked to review the Draft EIS/EIR for this the proposed construction and operation of an offshore floating storage and regasification unit (FSRU) that would be moored in Federal waters offshore of Ventura County. As proposed, liquefied natural gas (LNG) from the Pacific basin would be delivered by an LNG Carrier to and offloaded onto, the FSRU; re-gasified; and delivered onshore via two new 21.1-mile (33.8-kilometer), 24-inch (0.6-meter) diameter natural gas pipelines laid on the ocean floor. These pipelines would come onshore at Ormond Beach near Oxnard, California to connect through proposed new onshore pipelines to the existing Southern California Gas Company intrastate pipeline system to distribute natural gas throughout the Southern California region. Ms. Vahidi reviewed the document for technical adequacy and assisted the City in preparing written comments for the following sections of the EIS/EIR: Aesthetics, Land Use, Recreation, Socioeconomics, and Environmental Justice.
- **Long Beach LNG Import Project, Long Beach, CA.** Under contract to the City of Long Beach, Aspen was tasked to review the Draft EIS/EIR for the proposed construction and operation of this onshore LNG facility to be located at the Port of Long Beach. Ms. Vahidi reviewed the document for technical adequacy and assisted the City in preparing written comments for the following sections of the EIS/EIR: Aesthetics, Land Use, Recreation, Socioeconomics, Environmental Justice, and Port Master Plan Amendment.
- **Post-Suspension Activities of the Nine Federal Undeveloped Units and Lease OCS-P 0409, Off-shore Southern California.** Aspen assisted the U.S. Department of the Interior, Minerals Management Service (MMS) to prepare an Environmental Information Document (EID) evaluating the potential environmental effects associated with six separate suspensions for undeveloped oil and gas leases Pacific Outer Continental Shelf (OCS) located offshore Southern California. These undeveloped leases lie between 3 and 12 miles offshore Santa Barbara, Ventura and southern San Luis Obispo Counties and are grouped into nine units, with one individual lease that is not unitized. As the Senior Aspen social scientist, Ms. Vahidi guided the analysis of community characteristics and tourism resources, recreation, visual resources, social and economic environment, and military operations.
- **Otay River Watershed Management Plan (ORWMP) and Special Area Management Plan (SAMP) in San Diego County, CA.** Ms. Vahidi served as a Technical Senior for social science and land use issues. The ORWMP focused on developing strategies to protect and enhance beneficial uses within this watershed and thereby comply with the San Diego Region's NPDES permit, and the SAMP intended to achieve a balance between reasonable economic development and aquatic resource preservation, enhancement, and restoration in this 145-square-mile (93,000 acres) area through the issuance of Corps and CDFG programmatic permits.

California Energy Commission (CEC)

In response to California's power shortage, Aspen has assisted the CEC in evaluating the environmental and engineering aspects of new power plant applications throughout the State under three separate contracts. Ms. Vahidi has served as Technical Senior for land use (since 2001), and a specialist for socio-economics and environmental justice, and alternatives analyses and special studies. Her specific projects are listed below.

- **Technical Assistance in Application for Certification Review (Contract # 700-99-014; 3/6/2000 through 12/31/2003)**
 - **Woodland Generation Station No. 2, Modesto, CA.** As the land use Technical Specialist, prepared the Land Use and Recreation, and Agricultural Resources Staff Assessments of this 80-megawatt nominal, natural gas-fired power generating facility and associated linear facilities (i.e., gas and water pipeline and

transmission line. The Staff Assessment evaluated potential impacts on nearby residential, recreational, and agricultural land uses, including important farmlands being traversed by linear facilities.

- **Valero Cogeneration Project, Benicia, CA.** Prepared the Socioeconomics Staff Assessment for a proposed cogeneration facility at the Valero Refinery in Benicia. Issues addressed included impacts on public services and other project-related population impacts such as school impact fees.
- **Rio Linda/Elverta Power Project, Sacramento, CA.** Prepared the Socioeconomics Staff Assessment for a 560-megawatt natural gas power plant in the northern Sacramento County. Issues of importance included environmental justice and impacts on property values.
- **Magnolia Power Project, Burbank, CA.** As the Socioeconomics technical specialist, prepared the Staff Assessment for this nominal 250-megawatt natural gas combined-cycle fired electrical generating facility to be located at the site of the existing City of Burbank power plant. Environmental justice issues and potential impacts on local economy and employment were evaluated
- **Potrero Power Plant Project, San Francisco, CA.** Prepared the land use portion of the Alternatives Staff Assessment for this proposed nominal 540 MW natural gas-fired, combined cycle power generating facility. Analysis included review of several alternative sites for development of the power plant and the comparative merits of those alternatives with the proposed site located on the San Francisco Bay.
- **Los Esteros Critical Energy Facility, San Jose, CA.** Technical Senior for the Land Use Staff Assessment of this 180-megawatt natural-gas-fired simple cycle peaking facility. Issues included potential impacts resulting from loss of agricultural land, and impacts associated with the project's non-compliance with local General Plan land use and zoning designations.
- **East Altamont Energy Center, Alameda County, CA.** Technical Specialist for the Land Use Assessment for a 1,100-megawatt nominal, natural gas-fired power plant and associated linear facilities. Provided expert witness testimony on Land Use Staff Assessment. Major issues addressed in the Staff Assessment included loss of Prime Farmlands, recommendation of land preservation mitigation, and the project's non-compliance with local General Plan land use and zoning designations.
- **Tracy Peaker Project, Tracy, CA.** Technical Senior for the Land Use Staff Assessment of this 169-megawatt simple-cycle peaking facility in an unincorporated area of San Joaquin County. Provided expert witness testimony on Land Use Staff Assessment. Issues included potential impacts resulting from loss of agricultural land under Williamson Act Contract, and evaluation of cumulative development in the fast-growing surrounding area.
- **Avenal Energy Project, Kings County, CA.** Socioeconomics Technical Specialist for this 600-megawatt combined cycle electrical generating facility, and associated linear facilities.
- **Tesla Power Project, Alameda County, CA.** Land Use Technical Senior and Alternatives Technical Specialist in charge of preparation of two Staff Assessments for this project. The project will be a nominal 1,120-MW electrical generating power plant with commercial operation planned for third quarter of 2004. The Tesla Power Project will consist of a natural gas-fired combined cycle power generator, with 0.8 miles of double-circuit 230-kilovolt transmission line connected to the Tesla PG&E substation, 24-inch 2.8-mile natural gas pipeline, and 1.7-mile water line constructed along Midway Road.
- **Sacramento Municipal Utility District Consumes Power Plant Project, Sacramento, CA.** Socioeconomics and Alternatives Technical Specialist in charge of preparation of two Staff Assessments for this nominal 1,000-megawatt (MW) combined-cycle natural gas facility. Provided expert witness testimony on Socioeconomics Staff Assessment. The project would include the construction and operation of a natural gas power plant at the Rancho Seco Nuclear Plant, 25 miles southeast of the City of Sacramento, in Sacramento County. The project would be located on a 30-acre portion of an overall 2,480-acre site owned by SMUD.
- **Inland Empire Energy Center, Riverside County, CA.** Technical Specialist for the Land Use Assessment for a 670-megawatt natural gas-fired, combined-cycle electric generating facility and associated linear facilities including, a new 18-inch, 4.7-mile pipeline for the disposal of non-reclaimable wastewater, and a new 20-inch natural gas pipeline. Provided expert witness testimony on Land Use Staff Assessment. The project would be located on approximately 46-acres near Romoland, within Riverside County. Major issues addressed in the Staff Assessment included potential loss of agricultural lands, impacts to planned school uses, and the project's potential non-compliance with local General Plan land use and zoning designations.

- **Senior Technical Lead, Land Use Resources.** The California Energy Commission (CEC) requested that the Aspen Team provide Technical Seniors for the Land Use Resources area in order to help coordinate and review Land Use Resource Assessments. As a Technical Senior, Negar Vahidi was responsible for the technical review of Land Use sections for various power plants assigned to them.
- **Legislative Bill Review.** As a Land Use Technical Senior for the CEC, Ms. Vahidi conducted legislative bill review related to energy facilities siting. She conducted portions of the CEC Systems Assessment & Facilities Siting Division analysis of Senate Bill 1550 which was intended to give the Superintendent of Public Instruction/CDE approval authority over siting of power plants within one mile of existing or proposed K-12 school sites by requiring the CDE (in coordination with the State Architect, and the commission) to develop appropriate siting guidelines.
- **Engineering & Environmental Technical Assistance to Support the Energy Facility Planning and Licensing Program Contract (Contract # 700-02-004; 6/30/03 through 3/30/06)**
 - **Environmental Performance Report (EPR).** Ms. Vahidi managed the preparation of the Socioeconomics chapter of the EPR for the California Energy Commission, which eventually became part of the State of California's Integrated Energy Policy Report (IEPR). The Socioeconomics chapter addressed: the importance of reliable and affordable electricity supply power plant construction and operation impacts, including labor force, taxation, etc.; and trends in the energy section, including renewable power sources such as wind and solar. She also conducted the analysis of a new portion of the Land Resources Chapter, which addressed the siting and land use issues associated with renewable power. This new portion of the land use analysis compared the land use and siting constraints associated with renewable power infrastructure such as wind and solar versus other forms of power infrastructure, such as gas pipelines, transmission lines, LNG facilities, and power plants.
 - **Coastal Plant Study.** Ms. Vahidi served as the Social Sciences Task Manager for this special study being conducted as part of Aspen's contract with the California Energy Commission. The study included identification and evaluation of potential issues associated with the possible modernization, re-tooling, or expansion of California's 25 coastal power plants including: northern California power plants such as Humboldt, Potrero, Hunter's Point, Pittsburg, and Oakland; central coast power plants such as Contra Costa, Diablo Canyon Nuclear, Morro Bay, Moss Landing, Elwood, Mandalay, and Ormond Power Plants; and southern California power plants such as the Alamitos, Long Beach, Los Angeles Harbor, Haynes, Redondo Beach, Scattergood, El Segundo, Huntington Beach, Encina, Silver Gate, South Bay, and San Onofre Nuclear. As Task Manager her responsibilities included, identification of potential political, social, community, and physical land use impacts that may arise from the potential increased output of energy from plants in highly sensitive coastal communities. The intent of the study is to identify red flag items for the Energy Commission in order to streamline future licensing processes. Her task as the Social Science Task Manager also included a thorough review of applicable Local Coastal Plans, and Coastal Commission regulations associated with Coastal Development Permits and Consistency Determinations.
 - **Natural Gas Market Outlook Report (NGMOR).** Ms. Vahidi assisted the CEC's Natural Gas Unit as a technical editor in their preparation and publication of the NGMOR. She managed Aspen's efforts, including format and graphics, to edit technical sections prepared by Natural Gas Unit Staff under a condensed time frame. The Preliminary NGMOR was released for public review in June 2003.
- **Peak Workload Support for the Energy Facility Siting Program and the Energy Planning Program (Contract #700-05-002; 4/11/06 through 3/30/09)**
 - **Chula Vista Energy Upgrade Project, Chula Vista, CA.** Senior Technical Specialist for the Land Use Staff Assessment for MMC Energy, Inc.'s Application for Certification (AFC) to construct and operate replacements and upgrades of equipment at the Chula Vista Power Plant, located on a 3.8-acre parcel in the City of Chula Vista's Main Street Industrial Corridor and within the City's Light Industrial zoning district. Issues of concern include the impacts of the power plant on adjacent residential and open space land uses, and compliance with applicable local LORS. Provided expert witness testimony on Land Use Staff Assessment.
 - **Ivanpah Solar Electric Generating System Project, San Bernardino County, CA.** Senior Technical Specialist for the Socioeconomics Staff Assessment/BLM EIS for a 400-megawatt solar thermal electric power generating system. The project's technology would include heliostat mirror fields focusing solar energy on power tower receivers producing steam for running turbine generators. Related facilities would

include administrative buildings, transmission lines, a substation, gas lines, water lines, steam lines, and well water pumps. The proposed project would be developed entirely in the Mojave Desert region of San Bernardino County, California. The document was prepared in compliance with both NEPA and CEQA requirements.

- **Sentinel Energy Project, Riverside County, CA.** Senior Technical Specialist for the Land Use Staff Assessment for CPV Sentinel's Application for Certification (AFC) to construct and operate an 850-megawatt (MW) peaking electrical generating facility near SCE's Devers Substation. The proposed project site consists of 37 acres of land situated approximately eight miles northwest of the center of the City of Palm Springs with portions of the construction laydown area and natural gas pipeline within the Palm Springs city limits. Land use issues of concern include the project's compliance with local LORS.
- **Carrizo Energy Solar Farm, San Luis Obispo County, CA.** Senior Technical Specialist for the Land Use Staff Assessment for Carrizo Energy, LLC's Application for Certification (AFC) to build the Carrizo Energy Solar Farm (CESF), which will consist of approximately 195 Compact Linear Fresnel Reflector (CLFR) solar concentrating lines, and associated steam drums, steam turbine generators (STGs), air-cooled condensers (ACCs), and infrastructure, producing up to a nominal 177 megawatts (MW) net. The CESF is located in an unincorporated area of eastern San Luis Obispo County, west of Simmler and northwest of California Valley, California. The CESF includes the solar farm site, a minimal offsite transmission system connection, and construction laydown area. The CESF site will encompass approximately 640 acres of fenced area in an area zoned for agricultural uses as specified in the San Luis Obispo County General Land Use Plan. Issues of concern include the impacts of the power plant on adjacent land uses and compliance with applicable local LORS.
- **Carlsbad Energy Center Project, Carlsbad, CA.** Senior Technical Specialist for the Land Use and Alternatives Staff Assessments for Carlsbad Energy Center, LLC's Application for Certification (AFC) to build the Carlsbad Energy Center Project (CECP), which will consist of a 558 MW gross combined-cycle generating facility configured using two units with one natural-gas-fired combustion turbine and one steam turbine per or unit. Issues of concern include major incompatibilities with local LORS, and cumulative impacts from widening of I-5.
- **Marsh Landing Generating Station, Contra Costa County, CA.** Senior Technical Specialist for the Land Use Staff Assessment for the Mirant Marsh Landing, LLC AFC for a 930 MW natural gas-fired power plant, which would be sited adjacent to the existing Contra Costa Power Plant in unincorporated Contra Costa County, near the City of Antioch.
- **Canyon Power Plant, Anaheim, CA.** Senior Technical Specialist for the Socioeconomics Staff Assessments for a nominal 200 megawatt (MW) simple-cycle plant, using four natural gas-fired combustion turbines and associated infrastructure proposed by Southern California Public Power Authority (SCPPA). This project is a peaking power plant project located within the City of Anaheim, California.
- **Willow Pass Generating Station, Pittsburg, CA.** Senior Technical Specialist for the Land Use Staff Assessment for a new, approximately 550-megawatt (MW) dry-cooled, natural gas-fired electric power facility proposed by Mirant. Development of Willow Pass would entail the construction of two generating units and ancillary systems including, adjacent electric and gas transmission lines, and water and wastewater pipelines.
- **Marsh Landing Generating Station, Contra Costa County, CA.** Senior Technical Specialist for the Land Use Staff Assessment for a new, 930-megawatt (MW) gas-fired electric generating facility proposed by Mirant. Delta. The proposed 27-acre Project site would be located at the existing Contra Costa Power Plant.
- **Stirling Energy Systems Solar One, San Bernardino County, CA.** Senior Technical Specialist for the Land Use Staff Assessment/BLM EIS for a nominal 850-megawatt (MW) Stirling engine project, with construction planned to begin late 2010. The primary equipment for the generating facility would include the approximately 30,000, 25-kilowatt solar dish Stirling systems (referred to as SunCatchers), their associated equipment and systems, and their support infrastructure. Major issues of concern include the conversion of approximately 8,230 acres of open space to industrial uses, compliance with BLM's CDCA Plan, etc.
- **Stirling Energy Systems Solar Two, Imperial County, CA.** Senior Technical Specialist for the Land Use Staff Assessment/BLM EIS for a nominal 750-megawatt (MW) Stirling engine project, with construction

planned to begin either late 2009 or early 2010. The primary equipment for the generating facility would include the approximately 30,000, 25-kilowatt solar dish Stirling systems (referred to as SunCatchers), their associated equipment and systems, and their support infrastructure. Major issues of concern include conversion of 6,500 acres of public recreation land used for OHV use and camping, and compliance with the BLM's CDCA plan..

- **GWF Tracy Combined Cycle Power Plant, San Joaquin County, CA.** Senior Technical Specialist for the Land Use Staff Assessment for GWF's proposal to modify the existing TPP (see description above), a nominal 169-megawatt (MW) simple-cycle power plant, by converting the facility into a combined-cycle power plant with a nominal 145 MW, net, of additional generating capacity.
- **City of Palmdale Hybrid Power Plant Project, Palmdale, CA.** Senior Technical Specialist for the Land Use Staff Assessment for the Palmdale Hybrid Power Project (PHPP) proposed by the City of Palmdale. The PHPP consists of a hybrid of natural gas-fired combined-cycle generating equipment integrated with solar thermal generating equipment to be developed on an approximately 377-acre site in the northern portions of the City of Palmdale (City).
- **Lodi Energy Center, Lodi, CA.** Senior Technical Specialist for the Socioeconomics Staff Assessment for a combined-cycle nominal 225-megawatt (MW) power generating facility.
- **Abengoa Mojave Solar One Project, San Bernardino County, CA.** Senior Technical Specialist for the Land Use Staff Assessment of a nominal 250 megawatt (MW) solar electric generating facility to be located near Harper Dry Lake in an unincorporated area of San Bernardino County. Issues of concern include the impacts associated with the conversion of 1,765 acres of open space lands.
- **Genesis Solar Energy Project, Riverside County, CA.** Senior Technical Specialist for the Land Use Staff Assessment/BLM EIS for two independent solar electric generating facilities with a nominal net electrical output of 125 megawatts (MW) each, for a total net electrical output of 250 MW. Electrical power would be produced using steam turbine generators fed from solar steam generators. The project is located approximately 25 miles west of the city of Blythe. Major issues of concern include conversion of 4,460 acres of BLM lands to an industrial use.
- **Contra Costa Generating Station, Contra Costa County, CA.** Senior Technical Specialist for the Land Use Staff Assessment for a natural gas-fired, combined-cycle electrical generating facility rated at a nominal generating capacity of 624 megawatts (MW). The project would be located in the City of Oakley.
- **Topaz Solar Project EIR, San Luis Obispo County, CA.** (Applicant: First Solar). Aspen is managing preparation of an EIR for this 500 MW solar photovoltaic project in the Carrizo Plain area. A major issue of concern is the conversion of approximately 6,000 acres of open space (60 percent of which are under land preservation contracts) to an industrial use. Ms. Vahidi is the Senior in charge of developing the methodology, approach, and thresholds of significance for analysis of impacts related to agricultural land conversion using the CA Department of Conservation LESA Model. One major issue of concern related to agricultural resources is impacts to lands under Williamson Act contracts. She will be guiding the analysis.
- **California Valley Solar Ranch EIR, San Luis Obispo County, CA.** (Applicant: SunPower). Aspen is managing preparation of an EIR for this 250 MW solar photovoltaic project in the Carrizo Plain area. A major issue of concern is the conversion of approximately 4,000 acres of open space to an industrial use. Ms. Vahidi is the Senior in charge of developing the methodology, approach, and thresholds of significance for analysis of impacts related to agricultural land conversion using the CA Department of Conservation LESA Model. She will be guiding the analysis.
- **Santa Ana Valley Pipeline Repairs Project, San Bernardino and Riverside Counties, CA.** Under Aspen's on-going environmental services contract with the DWR, Ms. Vahidi served as the project manager for CEQA documentation and permitting efforts related to the repair of 12 sites along the pipeline portion of the East Branch of the California Aqueduct. The repair of the 12 sites was crucial because, eight of the Priority 1 sites included areas of the pipeline that were under high stress and subject to rupture. Issues of concern included, potential impacts to special status species, sensitive receptors, and traffic. As the DWR's CEQA consultant, Ms. Vahidi determined that the proposed SAPL Repairs Project would qualify for a CEQA Categorical Exemption, and recommended the preparation

of a Technical Memorandum to justify this exemption. The Technical Memorandum and supporting documentation, including a Biological Constraints Report, and analyses of proposed project potential construction-related air quality, noise, and traffic impacts, were prepared and presented to DWR as one packet to support both a Class 1 and Class 2 CEQA Exemption. Subsequent to preparation of this packet, DWR filed a Notice of Exemption on June 13, 2003 for their repair activities.

- **Piru Creek Erosion Repairs and Bridge Seismic Retrofit Project, Northern Los Angeles County, CA.** Under Aspen's on-going environmental services contract with the DWR, Ms. Vahidi served as the project manager for CEQA documentation for this project. An IS/MND was prepared to evaluate the impacts of the project, which proposed to maintain four access routes to DWR's facilities along the West Branch of the California Aqueduct downstream of the Pyramid Dam. Repair and improvement activities would occur on Osito Canyon (an intermittent tributary to Piru Creek) at Osito Adit, adjacent to Old Highway 99 at North Adit (or access tunnel), alongside an eroded section of Old Highway 99 along Piru Creek, and at Pyramid Dam Bridge. Repair activities would serve to improve conditions of access routes, as well as strengthening and reinforcing them against seismic or flood events. Project-related construction could result in potentially significant impacts to biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, noise, and transportation and traffic.
- **Pyramid Lake Repairs and Improvements Project, northern Los Angeles County.** Under Aspen's on-going environmental services contract with the DWR, Ms. Vahidi served as the project manager for CEQA documentation, ADA (Americans with Disabilities Act) compliance, and permitting efforts for this project. DWR and the Department of Boating and Waterways (DBW) are planning repairs and improvements at various recreational sites at Pyramid Lake, which is located on the border between Los Padres National Forest and Angeles National Forest; recreation is managed by Angeles National Forest. The lake is also part of Federal Energy Regulatory Commission Project 2426. Aspen worked with DWR and DBW to determine ADA compliance components at each site. CEQA documentation in support of a Class 1 and 2 Categorical Exemption was prepared to evaluate the potential impacts of the repairs and improvements, and provide CEQA clearance for filing of required permit applications, including but not necessarily limited to 404, 401, and 1602 permits. In addition to the CEQA documentation and preparation of permit applications, Aspen coordinated DWR and DBW's efforts with the USFS, and the permitting agencies (i.e., CDFG, RWQCB, and USACE). Through coordination with the USAC, Aspen prepared the NEPA EA for Corps 404 permit process, and reviewed and coordinated revisions to the 1602 with CDFG.
- **Mulholland Pumping Station and Lower Hollywood Reservoir Outlet Chlorination Station Project, Los Angeles, CA.** Under Aspen's on-going environmental services contract with the City of Los Angeles Department of Water and Power (LADWP), Ms. Vahidi served as the Project Manager for preparation of CEQA documentation for this project. LADWP proposed to replace the existing historic pumping/chlorination station building as well as the existing lavatory and unoccupied Water Quality Laboratory buildings with a new single structure pumping/chlorination station within the LADWP's Hollywood Reservoir Complex located in the Hollywood Hills section of the City Los Angeles. These improvements were required due to the age and deterioration of the facility and the potential risk of seismic damage to existing structures. An Initial Study was prepared in support of a City of Los Angeles General Exemption.
- **River Supply Conduit (RSC) Upper Reach Project EIR, Los Angeles and Burbank, CA.** Under Aspen's on-going environmental services contract with the City of Los Angeles Department of Water and Power (LADWP), Ms. Vahidi served as the Task Leader for land use issues and is in charge of development and analysis of project alternatives for the CEQA document for this project. The RSC is a major transmission pipeline in the LADWP water distribution system. The existing RSC pipeline's purpose is to transport large amounts of water from the Los Angeles Reservoir Complex and local ground water wells to reservoirs and distribution facilities located in the central areas within of the City of Los Angeles. The LADWP proposed a new larger RSC pipeline to replace and realign the

Upper and Lower Reaches of the existing RSC pipeline, which would involve the construction of approximately 69,600 linear feet (about 13.2 miles) of 42-, 48-, 60-, 66-, 72-, 84-, and 96-inch diameter welded steel underground pipeline.

- **Valley Generating Station Site Survey & Documentation Report, Los Angeles, CA.** Ms. Vahidi managed the preparation of a comprehensive report (over 150 pages) documenting all of the structures and facilities located at the Valley Generating Station (VGS). The report includes exhibits that illustrate locations of each structure at the VGS, a detailed appendix of color photos of each structure, and a written description of each structure. The report also provides a general discussion of the history and background of the VGS and its development to provide a context for the structures on site.
- **Taylor Yard Water Recycling Project (TYWRP), Los Angeles and Glendale, CA.** Under Aspen's on-going environmental services contract with the City of Los Angeles Department of Water and Power (LADWP), Ms. Vahidi served as the Project Manager for preparation of CEQA documentation for this project. LADWP proposed to construct the TYWRP in order to provide recycled water produced by the Los Angeles–Glendale Water Reclamation Plant (LAGWRP) to the Taylor Yard. An important part of the City of Los Angeles' expanding emphasis on water conservation is the concept that water is a resource that can be used more than once. Because all uses of water do not require the same quality of supply, the City has been developing programs to use recycled water for suitable landscaping and industrial uses. The project is located in the southernmost part of the City of Glendale and northeastern part of the City of Los Angeles. The IS/MND was adopted in the Summer of 2007.
- **Devers–Palo Verde 500 kV Transmission Line Project EIS/EIR, southern California/western Arizona.** For this EIR/EIS prepared by U.S. Bureau of Land Management and CPUC, Ms. Vahidi served as the Deputy Project Manager and Social Sciences Issue Area Coordinator for SCE's proposed 250-mile transmission line project from the Palo Verde Nuclear power plant in Arizona to the northern Palm Springs area in California. Major issues of concern include EMF and visual impacts on property values, impacts on the area's vast recreational resources and tribal lands, and the development and evaluation of several route alternatives, including the Devers-Valley No. 2 Route Alternative, which eventually was approved by the CPUC.
- **Antelope-Pardee 500 kV Transmission Line Project EIR/EIS, Los Angeles County, CA.** For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC, Ms. Vahidi is served as the Deputy Project Manager and Social Sciences Issue Area Coordinator for SCE's proposed 25-mile transmission line project from the Antelope Substation in the City of Lancaster, through the ANF, and terminating at SCE's Pardee Substation in Santa Clarita. Major issues of concern included impacts to biological, recreational, and cultural resources within Forest lands, EMF and visual impacts on property values, impacts on residences in the urbanized southern regions of the route, and the development and evaluation of several route alternatives.
- **Antelope Transmission Project, Segments 2 & 3 EIR, Los Angeles and Kern Counties, CA.** For this EIR being prepared by the CPUC, Ms. Vahidi served as the Deputy Project Manager and Social Sciences Issue Area Coordinator. The proposed Project includes both Segment 2 and Segment 3 of the Antelope Transmission Project, and involves construction of new transmission line infrastructure from the Tehachapi Wind Resource Area in southern Kern County, California, to SCE's existing Vincent Substation in Los Angeles County, California. The Tehachapi Wind Resource Area is one of the State's greatest potential sources for the generation of wind energy. A variety of wind energy projects are currently in development for this region. Major issues of concern include EMF and visual impacts on property values, impacts on residences and agricultural resources, and the development and evaluation of several substation and route alternatives.
- **Tehachapi Renewable Transmission Project (TRTP) EIR/EIS, Kern, Los Angeles, and San Bernardino Counties, CA.** For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC,

Ms. Vahidi is served as the Deputy Project Manager in the early stages (i.e., during Scoping) of the project for SCE's proposal to construct, use, and maintain a series of new and upgraded high-voltage electric transmission lines and substations to deliver electricity generated from new wind energy projects in eastern Kern County. Approximately 46 miles of the project would be located in a 200- to 400-foot right-of-way on National Forest System land (managed by the Angeles National Forest) and approximately three miles would require expanded right-of-way within the Angeles National Forest. The proposed transmission system upgrades of TRTP are separated into eight distinct segments: Segments 4 through 11. Segments 1 (Antelope-Pardee) and Segments 2 and 3 (Antelope Transmission Project) were evaluated in separate CEQA and NEPA documents as described above.

- **Jefferson-Martin 230 kV Transmission Line Project EIR, San Francisco Bay Area, CA.** Ms. Vahidi served as the Issue Area Coordinator for the Social Science issues of the EIR, and was responsible for preparation of the socioeconomics, recreation, and public utilities sections of the EIR prepared on behalf of the California Public Utilities Commission (CPUC) to evaluate a proposed 27-mile transmission line in San Mateo County. Major issues of concern included EMF and visual impacts on property values, impacts on the area's recreational resources, and evaluation of several route alternatives.
- **Miguel-Mission 230 kV #2 Project EIR, San Diego, CA.** Ms. Vahidi conducted the land use, recreation, socioeconomics, and environmental justice analyses for this EIR for a proposed 230 kV circuit within an existing transmission line ROW between Miguel and Mission substations in San Diego County. The proposed project included installing a new 230 kV circuit on existing towers along the 35-mile ROW, as well as relocate 69 kV and 138 kV circuits on approximately 80 steel pole structures. In addition, the Miguel Substation and Mission Substation would be modified to accommodate the new 230 kV transmission circuit.
- **Viejo System Project, Orange County, CA.** Ms. Vahidi served as the Deputy Project Manager for the project's CEQA documentation, including and Initial Study, prepared on behalf of the CPUC to evaluate Southern California Edison's (SCE) Application for a Permit to Construct the Viejo System Project, which was in SCE's forecasted demand of electricity and goal of providing reliable electric service in southern Orange County. The Viejo System Project would serve Lake Forest, Mission Viejo, and the surrounding areas. Components of the project included, construction of the new 220/66/12 kilovolt (kV) Viejo Substation, installation of a new 66 kV subtransmission line within an existing SCE right-of-way, replacement of 19 double-circuit tubular steel poles with 13 H-frames structures, and minor modification to other transmission lines. Major issues of concern include visual impacts of transmission towers, EMF effects, and project impacts on property values.
- **MARS EIR/EIS, Monterey, CA.** Ms. Vahidi served as the technical specialist in charge of preparing the Environmental Justice analysis for this EIR/EIS, which would evaluate the effects associated with the installation and operation of the proposed Monterey Accelerated Research System (MARS) Cabled Observatory Project (Project) proposed by Monterey Bay Aquarium Research Institute (MBARI)[NEPA Lead Agency]. The goal of the Project was to install and operate, in State and Federal waters, an advanced cabled observatory in Monterey Bay that would provide a continuous monitoring presence in the Monterey Bay National Marine Sanctuary (MBNMS) as well as serve as the test bed for a state-of-the-art regional ocean observatory, currently one component of the National Science Foundation (NSF) Ocean Observatories Initiative (OOI). The Project would provide real-time communication and continuous power to suites of scientific instruments enabling monitoring of biologically sensitive benthic sites and allowing scientific experiments to be performed. The environmental justice analysis evaluated the potential for any disproportionate project impacts to both land-based populations and fisheries workers. The CEQA Lead Agency was CSLC.
- **Kinder Morgan Concord-Sacramento Pipeline EIR.** Ms. Vahidi prepared the environmental justice and utilities and service systems sections of an EIR evaluating a proposed 70-mile petroleum products pipeline for the California State Lands Commission. Analysis included consideration of potential impacts of pipeline accidents in Contra Costa, Solano, and Yolo Counties.

- **Shore Marine Terminal Lease Consideration Project EIR, Contra Costa County, CA.** Served as Aspen's Project Manager (under contract to Chambers Group, Inc.) in charge of conducting the preparation of the Land Use, Recreation, Air Quality, and Noise sections of this EIR evaluating Shore Terminal, LLC's application to the California State Lands Commission (CLSC) to exercise the first of two 10-year lease renewal options, with no change in current operations. Shore Terminals operations comprise the marine terminal and on-land storage facilities in an industrial part of the city of Martinez. The marine terminal is on public land leased from the CSLC with the upland storage facilities located on private land.
- **Looking Glass Networks Fiber Optic Cable Project IS/MND, northern and southern California.** As part of Aspen's ongoing contract with the CPUC for review of Telecommunications projects, this document encompassed the evaluation of project impacts and network upgrades in the San Francisco Bay Area and the Los Angeles Basin Area. Ms. Vahidi served as the Deputy Project Manager and Study Area Manager for the Los Angeles Basin for this comprehensive CEQA document reviewing the potential impacts of hundreds of miles of newly proposed fiber optic lines throughout northern and southern California, including Los Angeles and Orange Counties. Issues of concern focused on potential construction impacts of linear alignments in highly urbanized rights-of-way, and resultant land use, traffic and utilities conflicts.
- **U.S. Army Corps of Engineers, Los Angeles District.** Ms. Vahidi is responsible for managing Delivery Orders and conducting the analyses of the social science issue areas for 16 projects throughout southern California and Arizona as part of two environmental services contracts. Delivery orders have included:
 - **Northeast Phoenix Drainage Area Alternatives Analysis Report, Phoenix and Scottsdale, AZ.** As the project manager guided the preparation of an alternatives analysis report that evaluated the potential environmental impacts associated with channel and detention basin alternatives to control flooding problems resulting from fast rate of development in the northeast Phoenix area.
 - **Imperial Beach Shore Protection EIS/EIR, Imperial Beach, CA.** Responsible for preparing the affected environment and environmental consequences sections for the land use, recreation, aesthetics, and socioeconomics issue areas. This EIS will analyze the impacts of shore protection measures along a 4.7-mile stretch of beach in southwest San Diego County.
 - **U.S. Food and Drug Administration Laboratory EIS/EIR, Irvine, CA.** Prepared the land use and recreation; socioeconomics, public services, and utilities; and visual resources/aesthetics analyses for this proposed "mega-laboratory" on the University of California Irvine Campus. Also developed the cumulative projects scenario for analyses of cumulative impacts. As the Public Participation Coordinator for the EIS/EIR review process, prepared the NOP, set up the scoping meeting and public hearing, prepared meeting handouts, and developed the project mailing list.
 - **San Antonio Dam EIS, Los Angeles and San Bernardino Counties, CA.** Responsible for preparing the cultural resources, land use and recreation, and aesthetics sections for the analysis of impacts resulting from the re-operation of San Antonio Dam to increase flood protection.
 - **Rio Salado Environmental Restoration EIS, Phoenix and Tempe, AZ.** Conducted the land use and recreation, and aesthetics analyses for this environmental restoration project in the Salt River and Indian Bend Wash located in the Cities of Phoenix and Tempe. Incidental to the primary objective of the Proposed Action (environmental restoration) is the creation of passive recreational opportunities associated with the restored habitat areas, such as trails for walking and biking, and areas for observing wildlife and learning about the natural history of the river.
 - **Airspace Restrictions EA, Ft. Irwin, CA.** Conducted the land use, recreation, aesthetics, and socioeconomics analyses of impacts for the conversion of unrestricted airspace to restricted airspace above Ft. Irwin in the Mojave Desert.
 - **National Guard Armory Building EA, Los Angeles, CA.** Conducted the land use, aesthetics, and socioeconomics analyses and prepared the cumulative impacts and policy consistency sections.

- **Supplemental EA for the Seven Oaks Dam Woolly Star Land Exchange, San Bernardino County, CA.** Prepared the land use and recreation analyses and policy consistency section.
- **Lower Santa Ana River Operations and Maintenance EA, Orange County, CA.** Responsible for conducting the land use, recreation, aesthetics, socioeconomics, and cultural resources analyses.
- **EA for Area Lighting, Fencing, and Roadways at the International Border, San Diego, CA.** Conducted the land use, aesthetics, and socioeconomics analyses and prepared the policy consistency section.
- **Border Patrol Checkpoint Station EA, San Clemente, CA.** Analyzed the aesthetic impacts of the installation of a concrete center divider and a Pre-inspected Automated Lane adjacent to and parallel to Interstate 5.
- **Upper Newport Bay Environmental Restoration Project, Newport Beach, CA.** Prepared physical setting, socioeconomics, land and water uses, and cultural resources sections for the Baseline Conditions Report and the Environmental Planning Report.
- **Whitewater/Thousand Palms Flood Control Project, Thousand Palms, CA.** Prepared the land use and recreation, aesthetics, and socioeconomics affected environment sections for the project's Baseline Conditions Report that was incorporated into the project EIS.
- **San Antonio Creek Bridges Project, Vandenberg Air Force Base, CA.** Prepared the physical setting, land use, socioeconomics, utilities, and aesthetics sections for analyses of bridge alternative impacts for missile transport on Vandenberg Air Force Base.
- **Ft. Irwin Expansion Mitigation Plan, Mojave Desert, CA.** Responsible for developing Ft. Irwin's Public Access Policy based on mitigation measures from the Army's Land Acquisition EIS for the National Training Center. Policy includes provisions for access by research and scientific uses.
- **Los Angeles Unified School District (LAUSD), Los Angeles County, CA.** Ms. Vahidi is Program Manager for Aspen's Environmental Master Services Agreement with the LAUSD (nation's second largest school district) to prepare CEQA documents (EIRs, IS/MNDs, Categorical Exemptions) in review of the LAUSD's four-phased new school construction program intended to meet existing and projected overcrowded conditions (200,000 seat shortfall) within the LAUSD (i.e., City of Los Angeles and all or parts of 28 surrounding jurisdictions cover 700 square miles of land). As the Program Manager, she is responsible for client interface and providing CEQA expertise to the LAUSD on day-to-day basis, QA/QC activities for all Aspen documents submitted, budget tracking and allocation, staff assignments, and the general day-to-day management of this contract. Thus far, Aspen has been awarded 48 CEQA document assignments for new school projects, school expansions and additions. In addition to her duties as the contract manager, Ms. Vahidi has managed the preparation of several CEQA documents under this contract, including:
 - **East Valley Middle School No. 2 EIR.** This middle school was proposed to be located at the previous Van Nuys Drive-In site. The EIR focused on impacts associated with air quality, hazards and hazardous materials, noise, land use and planning, and traffic and transportation. Major issues of concern included traffic and noise generated by school operation activities. The EIR included LAUSD design standards and measures employed to minimize environmental impacts.
 - **Canoga Park New Elementary School IS/MND.** This elementary school would be developed on a parcel of land owned by the non-profit organization, New Economics For Women (NEW). This "Turn-Key" project consisted of a Charter Elementary School to be developed by NEW and sold to the LAUSD for operation. It was later decided that NEW would lease the school back and run it as a charter school. Issues of concern included, pedestrian safety, traffic, air quality, noise, and land use.
 - **Mt. Washington Elementary School Multi-Purpose Room Addition Project IS/MND.** This project proposed the development of a multi-purpose room facility, including a library, auditorium, and theater, to the existing Mt. Washington Elementary School campus located in Los Angeles. The surrounding residential community had concerns regarding the proposed project's impacts on aesthetics, traffic, air quality, and noise. Of particular concern, were impacts generated due to the after-hours use of the multi-purpose room facility by civic and community groups.

- **New School Construction Program EIR.** Serves as a Study Area Manager (Valley Districts), and Issue Area Coordinator (IAC) (i.e., technical lead and reviewer) for social science issues, including land use, socioeconomics, public services, population and housing, and utilities and service systems. As the IAC, she has formulated the scope of work and methodology for analysis of issues and mitigation options. In addition to her managerial duties, Ms. Vahidi is preparing the Land Use section of the EIR, and directing the preparation of the Project's Scoping Report.
- **Belmont Senior High School 20-Classroom Modular Building Addition Project.** Under Aspen's ongoing master services agreement with the LAUSD, served as the project manager for CEQA documentation and permitting efforts related to the addition of modular classrooms to the existing Belmont Senior High School campus. Issues of concern included, potential impacts to sensitive receptors adjacent to the school from construction-related air quality, noise, and traffic, and operation-related noise generated by the new classrooms. As the LAUSD's CEQA consultant, Ms. Vahidi directed the preparation of technical documentation in support of a Class 32 In-Fill CEQA Categorical Exemption. This technical documentation included analyses of potential project-related air quality, noise, and traffic impacts, which were then submitted to LAUSD as one packet. Subsequent to preparation of this packet, LAUSD filed a CEQA Notice of Exemption for the classroom addition project.
- **Narbonne High School Stadium Lighting Project MND Addendum.** Served as the project manager for this project proposed to add a new stadium, lighting, and associated sport facilities needed to address existing needs at Narbonne High School. Issues of concern include lighting impacts to the surrounding neighborhood, and available parking stock.
- **SCE Calnev Power Line and Substation Project IS/MND.** Aspen was contracted to thoroughly review and analyze Southern California Edison Company's Application for a Permit to Construct and Proponent's Environmental Assessment (PEA) for the Calnev Power Line and Substation Project in the City of Colton. Ms. Vahidi served as the Deputy Project Manager for preparation of the IS/MND. Tasks include: a site visit, and evaluation of the project's compliance with the Commission's General Order 131D, Rule 17.1, and associated information submittal requirements; and preparation of a letter report identifying data deficiencies of the Application and PEA. Upon formal CPUC acceptance of the Application and PEA, Aspen prepared a CEQA Initial Study Checklist by identifying baseline data, project characteristics, and determining impact significance for each issue area. Each issue area's impact determination was supported by a paragraph or more of analysis describing the rationale for the impact identified, or for the lack of a significant impact. Upon completion of the Initial Study, the Mandatory Findings of Significance were prepared and Aspen determine that a Mitigated Negative Declaration should be prepared per CEQA Guidelines.
- **SCE Six Flags Substation and Power Line Project IS/MND.** Ms. Vahidi served as Deputy Project Manager for preparation of the IS/MND. Reviewed and provided comments on the permit application by SCE to construct a substation and power line to provide electrical service to Six Flags Amusement Park in Valencia, CA. Subsequent to the application completeness review, she prepared the project's Initial Study Checklist and Mitigated Negative Declaration for the California Public Utilities Commission (CPUC). Identified possible deficiencies and provided recommendations.
- **Industrywide Survey for the South Coast Air Quality Management District.** Ms. Vahidi coordinated Aspen's work for an Air Toxics Survey of harmful emissions by auto body and paint shops, performed in compliance with AB2588. She was responsible for development of an industrywide emission inventory for these facilities; she also performed information management, facility verifications, survey mail-outs, emissions calculations, analysis of calculated results, and preparation of the final report.
- **Technical Support to NEPA Lawsuit, Angeles National Forest, CA.** Ms. Vahidi prepared a detailed project chronology and a list of all applicable federal, State, and local laws and regulations in support of the USDA Office of General Counsel and National Forest's response to the City of Los Angeles' 1996 lawsuit on the adequacy of the Pacific Pipeline EIS.
- **Yellowstone Pipeline EIS, Lolo National Forest, Montana.** Environmental Justice and Public Services Issue Area Specialist. Responsible for conducting the analysis of project impacts on minority and

low-income populations to comply with Presidential Executive Order 12898 on Environmental Justice using Census data to determine population density, minority population percentages and unemployment rates to determine the potential for disproportionate project impacts on affected communities. Also responsible for conducting analysis of project impacts such as population immigration and pipeline accidents on public services in western Montana. During the EIS scoping process, she served as the project public participation coordinator and was responsible for preparation of the project newsletter, setup of the first round of scoping meetings, and determination of project information centers.

- **Santa Fe Pacific Pipeline Project EIR.** Ms. Vahidi was responsible for development and screening of alternatives for a 13-mile petroleum products pipeline from Carson to Norwalk, CA. Prepared analyses of project impacts on socioeconomics, public services, utilities, and aesthetics.
- **Pacific Pipeline Project Mitigation Monitoring, Compliance, and Reporting Program (MMCRP).** Ms. Vahidi served as the expert technical reviewer for the socioeconomics and environmental justice issues. As the MMCRP Agency Liaison, was responsible for developing protocol for efficient interagency communication procedures in coordination of mitigation activities with the CPUC, USFS, Responsible Agencies, and the project proponent. Also responsible for the development and management of the MMCRP Community Outreach and Public Access Program.
- **Pacific Pipeline Project EIR.** For the California Public Utilities Commission's (CPUC) EIR on the originally proposed route of this proposed pipeline (from Santa Barbara County to Los Angeles), Ms. Vahidi developed and coordinated a public participation program to comply with CEQA's mandate for information disclosure and public involvement in decision-making. The Final EIR was certified in September 1993.
- **Pacific Pipeline Project EIS and Subsequent EIR.** Ms. Vahidi prepared the socioeconomics and public services analysis, the Environmental Justice analysis in compliance with Presidential Executive Order 12898, as well as portions of the Land Use and Public Recreation analyses, including a comprehensive comparative analysis of project alternatives on this EIS/Subsequent EIR for the U.S. Forest Service (Angeles National Forest) and the CPUC. Ms. Vahidi managed the subsequent GIS mapping of socioeconomic data relative to pipeline corridor alternatives and other industrial facilities. She also prepared the cumulative projects list (covering a five county area for the Proposed Project and its alternatives) used for the cumulative scenario analyses of the various issue areas in the EIS/SEIR. As the Public Participation Program Coordinator for the project, she developed, implemented, and managed the public involvement efforts for the NEPA and CEQA environmental review processes. This included: setup and logistics for 20 separate scoping meetings, informational workshops, and public hearings along the project route; preparation of all meeting handouts; preparation of project newsletters and public notices; placement of project documents on Internet; and maintenance of the a project telephone information hotline. She also reviewed over 2,000 public comments (written and verbal) received on the Draft EIS/SEIR, for subsequent distribution to the project team.
- **Alturas Transmission Line Project EIR/EIS.** Ms. Vahidi conducted the analysis of potential impacts on minority populations and low-income populations in compliance with Presidential Executive Order 12898 on Environmental Justice using Census data to determine population density, minority population percentages and unemployment rates, and the potential impacts of the transmission line on affected communities. She also prepared the cumulative projects list and map used for analyses of cumulative impacts. She managed development of meeting handouts; scheduling and logistics for four scoping meetings; developed and maintained project mailing list; reviewed public scoping comments and prepared the Scoping Report; coordinated four sets of informational workshops and public hearings for the Draft EIR/EIS; supervised the distribution of comments on the Draft EIR/EIS to the project team; and coordinated the distribution of the Draft and Final EIR/EIS to affected public agencies, organizations, and citizens.

EIP Associates**1998 to 2001**

- **Program EIR for the Divestiture of PG&E's Hydroelectric Generation Assets.** For the CPUC's EIR evaluating the Pacific Gas & Electric Company's (PG&E) proposal to divest their hydroelectric facilities in California, served as the land use technical analyst for two watershed areas, and the Task Manager for the Socioeconomics and Transportation sections of the EIR covering five watershed areas. PG&E owns and operates the largest private hydroelectric power system in the nation. Situated in the Sierra Nevada, Southern Cascade, and Coastal mountain ranges of California, this system is strung along 16 different river basins and annually generates approximately five percent of the power consumed each year in California. The proposed sale of assets also includes approximately 140,000 acres of land proposed for sale with the hydroelectric system. The EIR analyzes the range of operational changes that could occur under new ownership, including complex integrated models that analyze power generation and water management. The land use section of the EIR examines the implications of the change in ownership of lands and the potential for impacts due to development or potential changes in use. Contributed significantly to the extensive GIS analysis, which was conducted to determine the development suitability and potential intensity of development that might occur on the lands if sold. These results served as one of the primary bases for analysis of impacts associated with the sale of the hydroelectric assets.
- **Section 108 Loan Guarantee EA/FONSI for the Waterfront Development Project.** Served as the Manager and Principal Preparer for this EA/FONSI for the City of Huntington Beach Economic Development Department. Prepared NEPA documentation evaluating the impacts resulting from the use of HUD Section 108 Loan guarantee funds for the Waterfront Resort Expansion Project in accordance with The HUD NEPA Guidelines and Format 1 (Environmental Assessments at the Community Level). Tasks included: (1) Evaluation of activities that would be categorically excluded from NEPA based on an assessment of the NEPA Implementing Guidelines for HUD Projects; (2) Evaluation of proposed actions compliance with all applicable federal statutes, regulations, and policies; and (3) Preparation of an Environmental Assessment/Mitigated Finding of No Significant Impact (EA/FONSI) for proposed actions that are not categorically excluded. Proposed actions to be evaluated consisted mainly of infrastructure improvement projects, rehabilitation and/or development of affordable housing, provision of relocation assistance, facilitation of development and/or redevelopment plans, property acquisition, provision of open space, etc.
- **MTA Mid Cities/Westside Transit Corridor Study EIS/EIR.** Served as the EIS/EIR Deputy Project Manager (DPM) for this 3-phase (including prepared the Major Investment Study (MIS), the Environmental Impact Statement (EIS), and an evaluation of the urban design implications of transit interventions on selected routes) study intended to address current and long range traffic congestion in the central and westside areas of the Los Angeles, Basin. Three east/west corridors and a range of transit alternatives ranging including Rapid Bus, light rail, and heavy rail are being evaluated. In addition to her duties as DPM for this comprehensive joint EIS/EIR, Ms. Vahidi prepared the Environmental Justice Analysis (per Executive Order 12898), the Section 4(f) Parklands discussion, and the land use and socioeconomics sections of the EIS/EIR.
- **Wes Thompson Ranch Development Project EIR.** Served as the EIR Project Manager for this hillside residential development in the City of Santa Clarita. Issues of concern included seismic and air quality impacts associated with the excavation of 2 million cubic yards of soil, the project's non-compliance with the City's hillside ordinance for innovative design, and traffic generated by project-related population growth in the area. Four different site configuration alternatives were developed as part of the EIR analysis. Other issues of concern included sensitive biological resources, the potential for hydrological impacts due to disturbance of the hillside, and cultural resources.
- **City of Santa Monica Environmental Assessments.** As one of the City's qualified CEQA consultants managed several environmental assessment documents for housing, commercial, institutional, and mixed-use developments in compliance with CEQA, including:

- **Berkeley Manor Condominium EIR and Technical Reports.** This one-issue EIR originally was a CEQA Categorical Exemption per direction of the City. During preparation of the Categorical Exemption documentation, it was determined that project-generated traffic would have potentially significant impacts. As a result, a traffic technical report was prepared as the background document for and EIR. In addition, shade and shadow impacts were evaluated in a technical report to ensure that shading impacts from the proposed structure on surrounding uses would not be significant. A simple Excel model was developed for calculation of shade and shadow angles.
- **Seaview Court Condominiums IS/MND.** This comprehensive Initial Study/Mitigated Negative Declaration included six technical reports including traffic, cultural resources, parking survey, shade and shadow analysis, and a geotechnical assessment to evaluate the level of severity of this development in the waterfront area of Santa Monica. Major issues of concern were; parking and project-generated traffic on adjacent narrow residential streets; visual obstruction and shading impacts of the proposed structure; liquefaction and seismic impacts to adjacent properties as result of the project's excavation for a subterranean parking garage; and the potential impacts of the project to impact the integrity of a historic district and the historic Seaview Walkway to the beachfront.
- **Four-Story Hotel IS/MND.** A comprehensive Initial Study/Mitigated Negative Declaration was prepared for this four-story hotel adjacent to St. John's Hospital in Santa Monica. Major issues of concern included project-generated traffic on surrounding multi-family residential uses and emergency access to the hospital.
- **Santa Monica College Parking Structure B Replacement EIR.** This focused EIR addressed issues related to traffic and neighborhood land use impacts associated with the addition of a 3-story parking structure in the center of the SMC campus. Major issues of concern included the potential for project-generated traffic to cause congestion at the school's main entrance on Pico Boulevard, and the potential for overflow traffic to impact the Sunset Community of single-family homes adjacent to the school.
- **North Main Street Mixed-Use Development Project EIR.** This EIR included evaluation of impacts resulting from the development of a mixed-use development in Santa Monica's "Commercial Corridor" on Main Street, with ground-floor residences and boutique commercial uses. Major issues of concern included traffic and parking impacts to Main Street and surrounding residential land uses, shade and shadow impacts, and neighborhood impacts.
- **Specific Plans and Redevelopment Projects.** As the senior technical lead for land use, prepared the project description, alternatives screening and development, cumulative scenario, and land use analysis for:
 - **Cabrillo Plaza Specific Plan EIR in Santa Barbara.** This project consisted of a mixed-use commercial development on Santa Barbara's waterfront on Cabrillo Boulevard. On-site uses included an aquarium, specialty retail, restaurants, and office space.
 - **Culver City Redevelopment Plan and Merger EIR.** This programmatic EIR evaluated the impacts of the City's redevelopment of its redevelopment zones. A major land use survey and calculation of acreage of redevelopment lands was conducted as part of the EIR.
 - **Dana Point Headlands Specific Plan EIR.** This EIR evaluated the development of coastal bluff in the City with hotel, single- and multi-family residential, and commercial uses. Major issues of concern included ground disturbance as a result of excavation, impacts to terrestrial and wildlife biology, recreation impacts to beachgoers, and project-generated population inducement.
 - **Blocks 104/105 Redevelopment Project EIR in Huntington Beach (Project Manager).** This EIR evaluated the development of a supermarket, retail shops, and office space in the City's Waterfront Redevelopment Zone. Issues of concern evaluated included traffic, land use, and impacts to on-site historic structures.

HONORS AND AWARDS

- 2006 American Planning Association, Los Angeles Section Environmental Award for the Los Angeles Unified School District New School Construction Program, Program EIR
- 2004 Association of Environmental Professionals Statewide Best EIR Award for the Jefferson-Martin 230 kV Transmission Project EIR.
- 2001 Outstanding Performance Award from the State of California Energy Commission.

- 1992-93 recipient of the USC Merit (“Ides of March”) Scholarship from the Southern California Association of Public Administrators (SCAPA).
- University of California, Irvine, School of Social Sciences. Graduated with Highest Honors in Political Science.

PROFESSIONAL ASSOCIATIONS

- American Planning Association (APA), Los Angeles Section Executive Board Member
- Association of Environmental Professionals (AEP)

DECLARATION OF Erin Bright

I, **Erin Bright**, declare as follows:

1. I am presently employed by the California Energy Commission in the **Engineering Office** of the Siting Transmission and Environmental Protection Division as a **Mechanical Engineer**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared the staff testimony on **Noise and Vibration** for the **Genesis Solar Energy Project** based on my independent analysis of the Application, supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: February 18, 2010

Signed: _____

At: Sacramento, California

Erin Bright
Mechanical Engineer

Experience Summary

Two years of experience in the electric power generation field, including analysis of noise pollution, construction/licensing of electric generating power plants, and engineering and policy analysis of thermal power plant regulatory issues. One year of experience in the alternative energy field, including analysis of alternative fuel production and use.

Education

- University of California, Davis--Bachelor of Science, Mechanical Engineering and Materials Science
- University of California, Davis Extension Program--Renewable Energy Systems

Professional Experience

2007 to Present-- Mechanical Engineer, Energy Facilities Siting Division - California Energy Commission

Performed analysis of generating capacity, reliability, efficiency, noise, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases.

2006 to 2007--Energy Analyst, Fuels & Transportation Division - California Energy Commission

Performed analysis of use potential and environmental effects of emerging non-petroleum fuels, including compressed natural gas, biomass, hydrogen and electricity, in heavy and light duty transportation vehicles. Contributor to Energy Commission's alternative fuels plan.

DECLARATION OF Testimony of Scott Debauche

I, **Scott Debauche**, declare as follows:

1. I am presently employed by Aspen Environmental Group, a contractor to the California Energy Commission, Siting, Transmission and Environmental Protection Division, as a **Socioeconomic Technical Specialist**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared the staff testimony on **Socioeconomics** for the **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 23, 2010 Signed: _____

At: Agoura Hills, California



SCOTT DEBAUCHE
Environmental Planner

ACADEMIC BACKGROUND

B.S., Urban & Regional Planning, University of Minnesota, 1994

PROFESSIONAL EXPERIENCE

Mr. Debauche is an environmental planner with over 14 years of experience preparing a variety of federal and State of California environmental, planning, and analytical documents for large-scale infrastructure and development projects. Mr. Debauche brings the experience of specializing in the integration and completion of NEPA and CEQA documentation joint documentation evaluating Transportation/Traffic, Noise, Socioeconomics and Environmental Justice, Air Quality, and Alternatives analyses.

Aspen Environmental Group

2001 to present

- **TANC Transmission Project (TTP) EIR/EIS, several Northern California Counties.** Mr. Debauche is currently serving as the Technical Specialist in charge of preparation of the EIR/EIS Transportation/Traffic and Socioeconomics CEQA/NEPA analyses. The Transmission Agency of Northern California (TANC) and Western Area Power Administration (Western), an agency of the U.S. Department of Energy (DOE), are the CEQA lead agency and NEPA lead agency, respectively. The TTP generally would consist of new and upgraded 500 kilovolt (kV) and 230 kV transmission lines, substations, and related facilities generally extending from northeastern California near Ravendale in Lassen County to the California Central Valley through Sacramento and Contra Costa Counties and westward into the San Francisco Bay Area.
- **Littlerock Reservoir Sediment Removal Project EIS/EIR, Palmdale, CA.** Mr. Debauche is the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, and Socioeconomics analyses for this joint EIS/EIR evaluating the impacts of sediment removal alternatives for the Littlerock Reservoir and Dam on USFS Angeles National Forest (NEPA Lead Agency) lands in Los Angeles County. The project involves impacts to the arroyo toad, extensive coordination with USFWS for a Section 7 consultation, incorporation of new Forest Service Plan updates and requirements into the analysis, preparation of the Forest Service required BE/BA, and analysis of compliance with federal conformity requirements. Aspen is currently working on the Administrative Draft EIR/EIS and assisting the PWD with portions of their Proposition 50 grant application to the DWR.
- **Alta Wind Project EIR, Kern County, CA.** Mr. Debauche is the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, and Air Quality analyses for this EIR. The applicant, Alta Windpower Development, LLC, proposes to develop the Alta-Oak Creek Mojave Project (proposed project or project) for the commercial production of up to 800 Megawatts (MW) of electricity from wind turbines. The proposed project would result in construction of up to 350 wind turbine generators, their ancillary facilities and supporting infrastructure located on three distinct land areas comprising a total of approximately 10,750 acres located approximately 3 miles west of State Route (SR) 14 (Antelope Valley Freeway) and 3 miles south of SR-58 in the Willow Springs area of eastern Kern County.

- **Liberty Energy Power Plant EIR, Banning, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Air Quality, Public Services and Utilities, and Hazardous Materials analyses for this CEQA document. Liberty Energy is proposing to construct a new biomass power plant, located at the eastern terminus of Westward Avenue in the City of Banning, Riverside County, California. The generating facility would include three power generation units (trains) to produce 15 MW (17.5 MW gross). Each unit would utilize a bubbling fluidized bed gasifier boiler to generate heat to produce high pressure steam.
- **Baldwin Hills Oil Field Community Standards District EIR Review and Ordinance Preparation, Culver City, CA.** Mr. Debauche served as the Technical Specialist for the City of Culver City reviewing the Los Angeles County Baldwin Hills Oils Field Community Standards District EIR Noise analysis evaluating the impacts of expanding the existing Baldwin Hills oil field. Once completed, Mr. Debauche then prepared the Noise section of the newly enacted City of Culver City Community Standards District overlay zone restricting noise generation by the Baldwin Hills Oil Field on the residents of Culver City.
- **Topaz Solar Project EIR, San Luis Obispo County, CA.** Mr. Debauche is the Technical Specialist in charge of preparation of the Transportation/Traffic and Air Quality sections of this EIR for this 500 MW solar photovoltaic project in the Carrizo Plain area. This project requires the conversion of approximately 6,000 acres of open space (60 percent of which are under land preservation contracts) to an industrial use.
- **California Valley Solar Ranch EIR, San Luis Obispo County, CA.** Mr. Debauche is the technical specialist in charge of preparation of the Air Quality analysis of this EIR for this 250 MW solar photovoltaic project in the Carrizo Plain area. This project requires the conversion of approximately 4,000 acres of open space to an industrial use.
- **Long Beach LNG Import Project EIR/EIS, Long Beach, CA.** Under contract to the City of Long Beach, Aspen was tasked to review the Draft EIS/EIR for the proposed construction and operation of this onshore LNG facility to be located at the Port of Long Beach. Mr. Debauche reviewed the document for technical adequacy and assisted the City in preparing written comments for the following sections of the EIS/EIR: Transportation/Traffic and Noise.
- **Sunset Substation and Transmission and Distribution Project EIR, Banning, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Socioeconomics, and Alternatives analyses for this EIR. The City of Banning proposes to construct the Sunset Substation and supporting 33-kilovolt (kV) transmission line that would interconnect with the City's existing distribution system. The purpose of this new substation and transmission is to relieve the existing overloads that are occurring within the City's electric system and to accommodate projected growth in the City.
- **MARS EIR/EIS, Monterey, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of the Environmental Justice analysis for this EIR/EIS, which would evaluate the effects associated with the installation and operation of the proposed Monterey Accelerated Research System (MARS) Cabled Observatory Project (Project) proposed by Monterey Bay Aquarium Research Institute (MBARI)[NEPA Lead Agency]. The goal of the Project was to install and operate, in State and Federal waters, an advanced cabled observatory in Monterey Bay that would provide a continuous monitoring presence in the Monterey Bay National Marine Sanctuary (MBNMS) as well as serve as the test bed for a state-of-the-art regional ocean observatory, currently one component of the National Science Foundation (NSF) Ocean Observatories Initiative (OOI). The Environmental Justice analysis evaluated the potential for any disproportionate project impacts to both land-based populations and fisheries workers.
- **Diablo Canyon Power Plant (DCPP) Steam Generator Replacement Project EIR, San Luis Obispo County, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation

of the Socioeconomics and Alternatives analyses sections of this EIR. The EIR addressed impacts associated with the replacement of the eight original steam generators (OSGs) at DCPD Units 1 and 2 due to degradation from stress and corrosion cracking, and other maintenance difficulties. The Proposed Project would be located at the DCPD facility, which occupies 760 acres within PG&E's 12,000-acre owner-controlled land on the California coast in central San Luis Obispo County. Land use issues of concern include impacts to agricultural lands, recreational resources, and potential Coastal Act inconsistencies.

- **Lake Canyon Dam and Detention Basin Project EIR, Ventura County, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Air Quality, and Hazardous Materials analyses for this CEQA document. The proposed project would include an earthfill dam and detention basin located in an unincorporated area of Ventura County, California. It would operate in conjunction with the existing Arundell Dam and Detention Basin, which is located an estimated 600 feet south-southwest and downstream of the proposed project site, to detain peak storm flows and capture the associated debris expected from a 100-year storm event.
- **Colton Substation Project IS/MND, Colton, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Air Quality, and Hazardous Materials analyses for this CEQA document. The City of Colton proposes to construct the 1.9 acrea North Substation and supporting 1.7 miles of 69 kV subtransmission and distribution facilities necessary to interconnect with the existing city-owned subtransmission and distribution systems.
- **San Antonio Creek Giant Reed Removal Project IS/MND, Ventura County, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of a number of technical issues area analyses for this CEQA document including: Transportation/Traffic, Noise, Air Quality, and Hazardous Materials. The purpose of the project is to remove giant reed within the upper reaches of the San Antonio Creek watershed and several tributaries to support other existing efforts to remove this invasive plant species along the main stem of the Ventura River and its watershed.

California Public Utilities Commission (CPUC). Under Aspen's environmental services contract with the CPUC, Mr. Debauche has prepared environmental analysis sections of environmental reports analyzing large-scale infrastructure projects. His project experience with the CPUC includes the following:

- **Tehachapi Renewable Transmission Project (TRTP) EIR/EIS, Kern, Los Angeles, and San Bernardino Counties, CA.** For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC, Mr. Debauche is currently serving as the Technical Specialist for Noise and Alternatives evaluation for SCE's proposal to construct, use, and maintain a series of new and upgraded high-voltage electric transmission lines and substations to deliver electricity generated from new wind energy projects in eastern Kern County. Approximately 46 miles of the project would be located in a 200- to 400-foot right-of-way on National Forest System land (managed by the Angeles National Forest) and approximately three miles would require expanded right-of-way within the Angeles National Forest. The proposed transmission system upgrades of TRTP are separated into eight distinct segments: Segments 4 through 11. Segments 1 (Antelope-Pardee) and Segments 2 and 3 (Antelope Transmission Project) were evaluated in separate CEQA and NEPA documents as described below.
- **Devers-Palo Verde 500 kV Transmission Line Project EIS/EIR, southern California/western Arizona.** For this EIR/EIS prepared by U.S. Bureau of Land Management and CPUC, Mr. Debauche served as the Technical Specialist for Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for SCE's proposed 250-mile transmission line project from the Palo Verde Nuclear power plant in Arizona to the northern Palm Springs area in California. Major issues of concern include EMF and visual impacts on property values, impacts on the area's vast recreational resources and tribal lands, and the development and evaluation of several route alternatives, including the Devers-Valley No. 2 Route Alternative, which eventually was approved by the CPUC.

- **Antelope-Pardee 500 kV Transmission Line Project EIS/EIR, Los Angeles County, CA.** For this EIR/EIS prepared by USFS, Angeles National Forest and CPUC, Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for SCE's proposed 25-mile transmission line project from the Antelope Substation in the City of Lancaster, through the ANF, and terminating at SCE's Pardee Substation in Santa Clarita. Major issues of concern included impacts to biological, recreational, and cultural resources within Forest lands, EMF and visual impacts on property values, impacts on residences in the urbanized southern regions of the route, and the development and evaluation of several route alternatives.
- **El Casco System Project EIR, Riverside, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Socioeconomics, and Alternatives analyses for this EIR prepared for the CPUC to evaluate SCE's application for a Permit to Construct (PTC) the El Casco System Project. The Proposed Project would be located in a rapidly growing area of northern Riverside County, which includes the Cities of Beaumont, Banning, and Calimesa. A 115 kV subtransmission line begins at Banning Substation and extends westward toward the proposed El Casco Substation site within the existing Banning to Maraschino 115 kV subtransmission line and Maraschino-El Casco 115 kV subtransmission line ROWs. Major issues of concern include impacts to existing and residential land uses, which have led to the development of a partial underground alternative and a route alternative different than the project route proposed by SCE (the Applicant). The 1,200-page Draft EIR was released for a 45-day public review and comment on December 12, 2007, and evaluates project alternatives at the same level of detail as the Proposed Project analysis.
- **Antelope Transmission Project, Segments 2 & 3 EIR, Los Angeles and Kern Counties, CA.** For this EIR prepared by the CPUC, Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation. The proposed Project includes both Segment 2 and Segment 3 of the Antelope Transmission Project, and involves construction of new transmission line infrastructure from the Tehachapi Wind Resource Area in southern Kern County, California, to SCE's existing Vincent Substation in Los Angeles County, California. The Tehachapi Wind Resource Area is one of the State's greatest potential sources for the generation of wind energy. A variety of wind energy projects are currently in development for this region. Major issues of concern include EMF and visual impacts on property values, impacts on residences and agricultural resources, and the development and evaluation of several substation and route alternatives.
- **SDG&E Miguel Mission Substation Draft EIR.** The major part of the Proposed Project would include the installation of a new, bundled 230 kV circuit between Miguel and Mission Substations, which would be located entirely within SDG&E's existing 35-mile ROW. Mr. Debauche prepared social science analysis for the Initial Study, as well as the Draft EIR Project Description and several key environmental sections.
- **PG&E's Proposed Divestiture of Hydroelectric Assets Project EIR.** Mr. Debauche prepared several key sections of the Draft EIR, including Socioeconomics and Hazardous Materials analysis. PG&E owns and operates the largest private hydroelectric power system in the nation. Situated in the Sierra Nevada, Southern Cascade, and Coastal mountain ranges of California, this system is strung along 16 different river basins and annually generates approximately five percent of the power consumed each year in California. The proposed sale of assets also includes approximately 140,000 acres of land proposed for sale with the hydroelectric system. The EIR analyzes the range of operational changes that could occur under new ownership, including complex integrated models that analyze power generation and water management.
- **Viejo System Project IS/MND, Orange County, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for the project's CEQA documentation, including and Initial Study, prepared on behalf of the CPUC to evaluate Southern California Edison's (SCE) Application for a Permit to Construct the Viejo System Project, which was in SCE's forecasted demand of electricity and goal of providing reliable electric service in southern Orange County. The Viejo System Project would serve Lake Forest, Mission Viejo, and the surrounding areas. Components of the project included, construction of the new 220/66/12 kilovolt (kV) Viejo Substation, installation of a new 66 kV subtransmission line within an existing SCE right-of-way, replacement of 19 double-circuit tubular steel poles with 13 H-frames structures, and minor modification to other transmission lines. Major issues of concern include visual impacts of transmission towers, EMF effects, and project impacts on property values.

- **Looking Glass Networks Fiber Optic Cable Project IS/MND, northern and southern California.** As part of Aspen's ongoing contract with the CPUC for review of Telecommunications projects, this document encompasses and evaluation of project impacts and network upgrades in the San Francisco Bay Area and the Los Angeles Basin Area. Prepared the socioeconomic analysis for this comprehensive CEQA document reviewing the potential impacts of hundreds of miles of newly proposed fiber optic lines throughout northern and southern California, including Los Angeles and Orange Counties. Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Socioeconomics, and Alternatives evaluation for the project's CEQA documentation.

California Energy Commission (CEC), Technical Assistance in Application for Certification Review.

In response to California's power shortage, Aspen is assisting the California Energy Commission in evaluating the environmental and engineering aspects of new power plant applications throughout the State. As part of this effort, Mr. Debauche works as a technical specialist for Transportation/Traffic, Socioeconomics and Environmental Justice, and Alternatives analyses for the following power plant projects:

- **Carlsbad Energy Center Project, Carlsbad, CA.** Technical Specialist in charge of preparation of the Transportation/Traffic and Alternatives Staff Assessments for Carlsbad Energy Center, LLC's Application for Certification (AFC) to build the Carlsbad Energy Center Project (CECP), which will consist of a 558 MW gross combined-cycle generating facility configured using two units with one natural-gas-fired combustion turbine and one steam turbine per or unit. Issues of concern include major incompatibilities with local LORS, and cumulative impacts from widening of I-5.
- **Hydrogen Energy California Power Plant Project, Kern County CA.** Technical Specialist in charge of preparation of the Transportation/Traffic and Socioeconomics/Environmental Justice Staff Assessments for Hydrogen Energy International, LLC integrated gasification combined cycle (IGCC) power generating facility called Hydrogen Energy California (HECA) in Kern County, California. The proposed project will gasify petroleum coke (or blends of petroleum coke and coal, as needed) to produce hydrogen to fuel a combustion turbine operating in combined cycle mode. The gasification component would produce 180 million standard cubic feet per day (MMSCFD) of hydrogen to feed a 390 megawatt (MW) gross combined cycle plant providing California with low-carbon baseload power to the grid.
- **CPV Vaca Station Power Plant Project, Vacaville, CA.** Technical Specialist in charge of preparation of the Transportation/Traffic Staff Assessment prepared for the CPV Vaca Station (CPVV) project, a natural gas-fired, combined-cycle electrical generating facility rated at a nominal generating capacity of 660 megawatts (MW). The CPVV is proposed for a 24-acre site located at the intersection of Lewis and Fry roads in a rural area within the city limits of Vacaville, Solano County.
- **Ivanpah Solar Electric Generating System Project, San Bernardino County, CA.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessment/BLM EIS for a 400-megawatt solar thermal electric power generating system. The project's technology would include heliostat mirror fields focusing solar energy on power tower receivers producing steam for running turbine generators. Related facilities would include administrative buildings, transmission lines, a substation, gas lines, water lines, steam lines, and well water pumps. The proposed project would be developed entirely in the Mojave Desert region of San Bernardino County, California.
- **Abengoa Mojave Solar Power Project, San Bernardino County, CA.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessment for a nominal 250 megawatt (MW) solar electric generating facility to be located near Harper Dry Lake in an unincorporated area of San Bernardino County. The project will implement well-established parabolic trough technology to solar heat a heat transfer fluid (HTF) technology.
- **Rice Solar Energy Generating System Project, Riverside County, CA.** Technical Specialist in charge of preparation of the Transportation/Traffic Staff Assessment/BLM EIS for a 50,000 megawatt hours (MWh) of renewable energy annually, with a nominal net generating capacity of 150 megawatts (MW) located in an unincorporated area of eastern Riverside County, California. The proposed facility will use concentrating solar power (CSP) technology, with a central receiver tower and an integrated thermal storage system.

- **Blythe Solar Power Project, Riverside County, CA.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessment/BLM EIS for a 1,000 MW solar thermal electric generating facility in Riverside County. The project will utilize solar parabolic trough technology to generate electricity. With this technology, arrays of parabolic mirrors collect heat energy from the sun and refocus the radiation on a receiver tube located at the focal point of the parabola.
- **GWF Henrietta Peaker Project, Kings County, CA.** Technical Specialist in charge of preparation of the Transportation/Traffic Staff Assessment for GWF's proposal to modify the existing Henrietta Power Plant. New once-through steam generators (OTSGs) will be installed to allow the plant to be operated in its current simple-cycle configuration with no steam generation but with the selective catalytic reduction (SCR) and oxidation catalyst in operation, or to operate as a combined-cycle power plant generating an additional 25 MW of power with new proposed emission limits.
- **Palen Solar Power Project, Riverside County, CA.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessment/BLM EIS for a 500 MW solar thermal electric generating facility in Riverside County. The Project will utilize solar parabolic trough technology to generate electricity. With this technology, arrays of parabolic mirrors collect heat energy from the sun and refocus the radiation on a receiver tube located at the focal point of the parabola.
- **Watson Cogeneration Steam and Electric Reliability Project, Carson, CA.** Technical Specialist for the Transportation/Traffic Staff Assessment for a nominal 85 MW combustion turbine generator (CTG), with a single-pressure heat recovery steam generator (HRSG) to provide additional process steam to the BP Carson refinery, to the existing cogeneration facility owned by Watson. The project site is a 2.5-acre brown field site located within the boundary of the existing Watson Cogeneration Facility, which is a 21.7-acre area within BP's existing Carson Refinery (BP Refinery), in the City of Carson, Los Angeles County.
- **Oakley Generating Station Project, Oakley, CA.** Technical Specialist in charge of preparation of the Transportation/Traffic Staff Assessment for a natural gas-fired, combined-cycle electrical generating facility rated at a nominal generating capacity of 624 megawatts (MW). The proposed project would be located in the City of Oakley, in Contra Costa County.
- **Canyon Power Plant Project, Anaheim, CA.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessments for a nominal 200 megawatt (MW) simple-cycle plant, using four natural gas-fired combustion turbines and associated infrastructure proposed by Southern California Public Power Authority (SCPPA). This project is a peaking power plant project located within the City of Anaheim, California.
- **GWF Tracy Combined Cycle Power Plant Project, San Joaquin County, CA.** Technical Specialist in charge of preparation of the Transportation/Traffic Staff Assessment for GWF's proposal to modify the existing TPP, a nominal 169-megawatt (MW) simple-cycle power plant, by converting the facility into a combined-cycle power plant with a nominal 145 MW, net, of additional generating capacity.
- **Lodi Energy Center Project, Lodi, CA.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessment for a natural gas-fired, combined-cycle electrical generating facility rated at a nominal 225-megawatt (MW). The Lodi Energy Center is proposed for a site parcel of approximately 4.4 acres adjacent to the City of Lodi's White Slough Water Pollution Control Facility (WPCF)
- **Kings River Conservation District Community Peaker Power Plant Project, Fresno County, CA.** Technical Specialist in charge of preparation of the Transportation/Traffic Staff Assessment for the Kings Rivers Conservation District, who filed a Small Power Plant Exemption for the King River Conservation District Peaking Power Plant. The proposed 97-megawatt natural gas-fired plant will be located south of the City of Fresno and near the community of Malaga in Fresno County.
- **Valero Cogeneration Project, Benicia, CA.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessments for a proposed cogeneration facility at the Valero Refinery in Benicia. Issues addressed included impacts on public services and other project-related population impacts such as school impact fees.
- **Rio Linda/Elverta Power Project, Sacramento, CA.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessments for a 560-megawatt natural gas power plant in

the northern Sacramento County. Issues of importance included environmental justice and impacts on property values.

- **Magnolia Power Project, Burbank, CA.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessments for this nominal 250-megawatt natural gas combined-cycle fired electrical generating facility to be located at the site of the existing City of Burbank power plant. Environmental justice issues and potential impacts on local economy and employment were evaluated.
- **Avenal Energy Project, Kings County, CA.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessments for a 600-megawatt combined cycle electrical generating facility, and associated linear facilities.
- **Inland Empire Energy Center Project, Riverside County, CA.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessments for a 670-megawatt natural gas-fired, combined-cycle electric generating facility and associated linear facilities including, a new 18-inch, 4.7-mile pipeline for the disposal of non-reclaimable wastewater, and a new 20-inch natural gas pipeline. The project would be located on approximately 46-acres near Romoland, within Riverside County.
- **Coastal Plant Study.** Technical Specialist in charge of preparation of the Socioeconomics/Environmental Justice Staff Assessments for a possible modernization, re-tooling, or expansion of California's 25 coastal power plants including the Encina Power Plant and the San Onofre Nuclear Power Plant.

Los Angeles Department of Water and Power (LADWP). Responsible for conducting the analyses of the technical and social science issue areas for a variety of EISs and EAs as part of two environmental services contracts. Delivery orders have included:

- **River Supply Conduit (RSC) Upper Reach Project EIR, Los Angeles and Burbank, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Socioeconomics, and Alternatives analyses for the CEQA document for this project. The RSC is a major transmission pipeline in the LADWP water distribution system. The existing RSC pipeline's purpose is to transport large amounts of water from the Los Angeles Reservoir Complex and local ground water wells to reservoirs and distribution facilities located in the central areas within of the City of Los Angeles. The LADWP proposed a new larger RSC pipeline to replace and realign the Upper and Lower Reaches of the existing RSC pipeline, which would involve the construction of approximately 69,600 linear feet (about 13.2 miles) of 42-, 48-, 60-, 66-, 72-, 84-, and 96-inch diameter welded steel underground pipeline.
- **Mulholland Pumping Station and Lower Hollywood Reservoir Outlet Chlorination Station Project IS/MND, Los Angeles, CA.** Under Aspen's on-going environmental services contract with the City of Los Angeles Department of Water and Power (LADWP), Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Socioeconomics, and Alternatives analyses for this project. LADWP proposed to replace the existing historic pumping/chlorination station building as well as the existing lavatory and unoccupied Water Quality Laboratory buildings with a new single structure pumping/chlorination station within the LADWP's Hollywood Reservoir Complex located in the Hollywood Hills section of the City Los Angeles. These improvements were required due to the age and deterioration of the facility and the potential risk of seismic damage to existing structures. An Initial Study was prepared in support of a City of Los Angeles General Exemption.
- **Taylor Yard Water Recycling Project (TYWRP) IS/MND, Los Angeles and Glendale, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Socioeconomics, and Alternatives analyses for this project. LADWP proposed to construct the TYWRP in order to provide recycled water produced by the Los Angeles–Glendale Water Reclamation Plant (LAGWRP) to the Taylor Yard. An important part of the City of Los Angeles' expanding emphasis on water conservation is the concept that water is a resource that can be used more than once. Because all uses of water do not require the same quality of supply, the City has been developing programs to use recycled water for suitable landscaping and industrial uses. The project is located in the southernmost part of the City of Glendale and northeastern part of the City of Los Angeles. The IS/MND was adopted in the Summer of 2007.

- **DC Electrode Project IS/MND, Los Angeles, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Socioeconomics, and Alternatives analyses for this project. LADWP proposed to construct a new electrode distribution line from West Los Angeles to the Pacific Ocean stopping point in Malibu, CA up the Pacific Coast Highway.
- **District Cooling Plant Project, Los Angeles IS/MND, CA.** Mr. Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic, Noise, Socioeconomics, and Alternatives analyses for this project. LADWP proposed to construct a District Cooling Plant and Distribution System (proposed project) in order to provide a centralized system for producing chilled water for use by area users, which are generally large commercial, governmental, industrial and institutional buildings who generate their own chilled water utilizing individual chiller plants for space cooling and air-conditioning.

U.S. Army Corps of Engineers, Los Angeles District. Responsible for conducting the analyses of the social science issue areas for a variety of EISs and EAs as part of two environmental services contracts. Delivery orders have included:

- **Prado Basin/Norco Bluffs/Reach 9 of the Santa Ana River Dikes Supplemental EAs, Riverside County, CA.** Debauche served as the Technical Specialist in charge of preparation of the Transportation/Traffic analysis of two structural alternatives for the Norco Bluffs Toe Stabilization project as well as the No Action/No Project Alternative. Aspen developed the alternatives analyzed in this Supplemental NEPA Environmental Assessment document, a description of the alternatives' physical, construction, and operational characteristics, and a discussion of the potential environmental impacts.
- **Northeast Phoenix Drainage Area Alternatives Analysis Report, Phoenix and Scottsdale, AZ.** Mr. Debauche served as a Technical Specialist in charge of preparation of the Alternatives analysis report that evaluated the potential environmental impacts associated with channel and detention basin alternatives to control flooding problems resulting from fast rate of development in the northeast Phoenix area.
- **Murrieta Creek Flood Control and Environmental Restoration Project.** Mr. Debauche served as a Technical Specialist in charge of preparation of the Environmental Assessment and Mitigation Monitoring plan for Phase 1 of a flood control and restoration project in Riverside County.

California Department of Water Resources. Responsible for conducting the environmental analyses for CEQA compliance as part of two environmental services contracts. Delivery orders have included:

- **Piru Creek Stabilization and Restoration Project IS/MND, northern Los Angeles County.** The California Department of Water Resources (CDWR) proposes to repair erosion damage at a series of three locations downstream of Pyramid Dam and seismically retrofit the Pyramid Dam access bridge that crosses Piru Creek. Mr Debauche served as Technical Specialist in charge of preparation of the Initial Study Transportation/Traffic, Noise, Socioeconomics, and Alternatives analyses for the proposed project.
- **Pyramid Lake Repairs and Improvements Project IS/MND and EA, northern Los Angeles County.** Mr Debauche served as Technical Specialist in charge of preparation of the Initial Study Transportation/Traffic, Noise, Socioeconomics, and Alternatives analyses for the proposed project, which DWR and the Department of Boating and Waterways (DBW) conducted repairs and improvements at various recreational sites at Pyramid Lake, which is located on the border between Los Padres National Forest and Angeles National Forest; recreation is managed by Angeles National Forest. In addition to the CEQA documentation and preparation of permit applications, Aspen coordinated DWR and DBW's efforts with the USFS, and the permitting agencies (i.e., CDFG, RWQCB, and USACE). Through coordination with the USAC, Aspen prepared the NEPA EA for Corps 404 permit process, and reviewed and coordinated revisions to the 1602 with CDFG.

Los Angeles Unified School District (LAUSD), Los Angeles County, CA. Deputy Program manager and Technical writer for several CEQA documents (EIRs and IS/MNDs) being prepared as part of Aspen's ongoing services contract with the LAUSD to help approve school projects that would meet existing overcrowded conditions in the greater Los Angeles area. Projects have included:

- **New School Construction Program EIR.** Served as a Technical Specialist in charge of preparation of the social science issues, including Socioeconomics, Noise, Transportation/Traffic, and Alternatives analyses for this Program EIR being prepared for the LAUSD. The LAUSD 2020 Program would provide student

seats throughout the LAUSD via a combination of the addition of portable classrooms to existing campuses, modernization and reconfiguration of existing campuses, and the construction of new schools.

- **East Valley Middle School No. 2 EIR.** Served as a Technical Specialist for this middle school project proposed to be located at the previous Van Nuys Drive-In site, preparing the Transportation/Traffic and Noise analyses. The EIR focused on impacts associated with air quality, hazards and hazardous materials, noise, land use and planning, and traffic and transportation. Major issues of concern included traffic and noise generated by school operation activities. The EIR included LAUSD design standards and measures employed to minimize environmental impacts.
- **Mt. Washington Elementary School Multi-Purpose Room Addition Project IS/MND.** Served as the Technical Specialist in charge of preparation of the IS/MND for the development of a multi-purpose room facility, including a library, auditorium, and theater, to the existing Mt. Washington Elementary School campus located in Los Angeles. The surrounding residential community had concerns regarding the proposed project's impacts on aesthetics, traffic, air quality, and noise. Of particular concern, was impacts generated due to the after-hours use of the multi-purpose room facility by civic and community groups.
- **Canoga Park New Elementary School IS/MND.** Served as the Technical Specialist in charge of preparation of the IS/MND for this elementary school project proposed to be developed on a parcel of land owned by the non-profit organization, New Economics For Women (NEW). This "turn-key" project consisted of a Charter Elementary School to be developed by NEW and sold to the LAUSD for operation. It was later decided that NEW would lease the school back and run it as a charter school. Issues of concern included, pedestrian safety, traffic, air quality, noise, and land use.
- **Hughes Magnet Span School IS/MND.** Served as the Technical Specialist in charge of preparation of the Socioeconomics, Hydrology, Public Services and Utilities, and Recreational analyses for the proposed re-opening of the existing Hughes Middle School as a Magnet Span School serving up to 1,620 District 6th through 12th grade students. The re-opening of the Hughes Middle School would require the relocation of the existing uses of the campus. The existing Enadia Way Elementary School and Platt Ranch Elementary School would be re-opened for the relocation of these uses.
- **Wonderland Elementary School Portable Classroom Additions IS/MND.** Served as the Technical Specialist in charge of preparation of the IS/MND for a proposed addition to the Wonderland Avenue Elementary School, located in the City of Los Angeles.
- **Pio Pico Elementary School Playground Expansion IS/MND.** Technical Specialist in charge of preparation of the Notice of Preparation, Initial Study, and Administrative Draft EIR for the expansion of a playground at the existing Pio Pico School in the LAUSD. The playground was proposed on five residential properties. One of the residences is a potentially significant historical resource because of its association with an African-American woman journalist, Fay M. Jackson. This project was cancelled by the LAUSD after completion of the administrative draft report.
- **Fairfax Senior High School Portable Classroom Addition IS/MND.** Served as Technical Specialist in charge of preparation of the IS/MND for the addition of portable classrooms at the school. Major issue areas covered were noise, hydrology, and geotechnical analysis.
- **Polytechnic Senior High School Portable Classroom Addition IS/MND.** Served Technical Specialist in charge of preparation of the IS/MND for the addition of portable classrooms at the school. Major issue areas covered were noise, hydrology, and geotechnical analysis.
- **Washington Senior High School Portable Classroom Addition IS/MND.** Technical Specialist in charge of preparation of the IS/MND for the addition of portable classrooms at the school. Major issue areas covered were noise, hydrology, and geotechnical analysis.

EIP Associates

1998 to 2001

MTA Mid Cities/Westside Transit Corridor Study EIS/EIR. Was a key Technical Specialist in charge of preparation of the EIS/EIR for this 3-phase (including prepared the Major Investment Study (MIS), the Environmental Impact Statement (EIS), and an evaluation of the urban design implications of transit interventions on selected routes) study intended to address current and long range traffic congestion in the central and westside areas of the Los Angeles Basin. Three east/west corridors and a range of transit

alternatives ranging including Rapid Bus, light rail, and heavy rail are being evaluated. In addition to preparing several issue area chapters of this comprehensive joint EIS/EIR, Mr. Debauche assisted with the Environmental Justice analysis, the Section 4(f) Parklands discussion, Transportation/Traffic, and the Land Use sections of the EIS/EIR.

Wes Thompson Ranch Development Project EIR. Served as Technical Specialist for this hillside residential development in the City of Santa Clarita. Issues of concern included seismic and air quality impacts associated with the excavation of 2 million cubic yards of soil, the project's non-compliance with the City's hillside ordinance for innovative design, and traffic generated by project-related population growth in the area. Four different site configuration alternatives were developed as part of the EIR analysis. Other issues of concern included sensitive biological resources, the potential for hydrological impacts due to disturbance of the hillside, and cultural resources. As the technical writer for socioeconomics, noise, hazardous materials, air quality, and public services, Mr. Debauche conducted the Transportation/Traffic and Alternatives analyses.

City of Santa Monica Environmental Assessments. Was key Technical Specialist in charge of preparation of several environmental assessment documents for housing, commercial, institutional, and mixed-use developments in compliance with CEQA. As the technical writer for socioeconomics, noise, hazardous materials, air quality, and public services, Mr. Debauche conducted the Transportation/Traffic, Noise, and Alternatives analyses for:

- **Seaview Court Condominiums IS/MND.** This comprehensive Initial Study/Mitigated Negative Declaration included six technical reports including traffic, cultural resources, parking survey, shade and shadow analysis, and a geotechnical assessment to evaluate the level of severity of this development in the waterfront area of Santa Monica. Major issues of concern were; parking and project-generated traffic on adjacent narrow residential streets; visual obstruction and shading impacts of the proposed structure; liquefaction and seismic impacts to adjacent properties as result of the project's excavation for a subterranean parking garage; and the potential impacts of the project to impact the integrity of a historic district and the historic Seaview Walkway to the beachfront.
- **Four-Story Hotel IS/MND.** A comprehensive Initial Study/Mitigated Negative Declaration was prepared for this four-story hotel adjacent to St. John's Hospital in Santa Monica. Major issues of concern included project-generated traffic on surrounding multi-family residential uses and emergency access to the hospital.
- **Santa Monica College Parking Structure B Replacement EIR.** This focused EIR addressed issues related to traffic and neighborhood land use impacts associated with the addition of a 3-story parking structure in the center of the SMC campus. Major issues of concern included the potential for project-generated traffic to cause congestion at the school's main entrance on Pico Boulevard, and the potential for overflow traffic to impact the Sunset Community of single-family homes adjacent to the school.
- **North Main St. Mixed-Use Development Project EIR.** This EIR included evaluation of impacts resulting from the development of a mixed-use development in Santa Monica's "Commercial Corridor" on Main Street, with ground-floor residences and boutique commercial uses. Major issues of concern included traffic and parking impacts to Main Street and surrounding residential land uses, shade and shadow impacts, and neighborhood impacts.

Specific Plans and Redevelopment Projects. As Technical Specialist for Transportation/Traffic, Socioeconomics, Noise, Hazardous Materials, Air Quality, and Public Services/Utilities, Mr. Debauche conducted analyses and prepared these environmental sections for:

- **Cabrillo Plaza Specific Plan EIR in Santa Barbara.** This project consisted a mixed-use commercial development on Santa Barbara's waterfront on Cabrillo Boulevard. On-site uses included an aquarium, specialty retail, restaurants, and office space.
- **Culver City Redevelopment Plan and Merger EIR.** This programmatic EIR evaluated the impacts of the City's redevelopment of its redevelopment zones. A major land use survey and calculation of acreage of redevelopment lands was conducted as part of the EIR.

- **Dana Point Headlands Specific Plan EIR.** This EIR evaluated the development of coastal bluff in the City with hotel, single- and multi-family residential, and commercial uses. Major issues of concern included ground disturbance as a result of excavation, impacts to terrestrial and wildlife biology, recreation impacts to beachgoers, and project-generate population inducement.
- **Triangle Gateway Redevelopment Project EIR in Beverly Hills, CA.** This EIR evaluated the development of a supermarket, retail shops, and office space in the triangle gateway portion of downtown Beverly Hills. Issues of concern evaluated by Mr. Debauche included traffic, land use, and impacts to on-site historic structures.
- **UCLA Campus Housing Expansion.** This EIR evaluated the development and expansion of campus housing within the UCLA campus. Issues of concern evaluated by Mr. Debauche included hazardous materials and population/housing.

CH2M Hill - Minneapolis, MN

1995 to 1998

- **Minneapolis/St. Paul International Airport Expansion EIS:** Mr. Debauche was a key writer of the EIS for this \$4 million technical and environmental study, including the preparation of an Environmental Impact Statement (EIS), and an evaluation of the urban design implications of a proposed \$800 million expansion of the existing MSP International airport, including transit and terminal modifications and the inclusion of a new perpendicular runway. The studies included alternatives to the project and the long-term effects on the cities of Minneapolis and St. Paul. In addition to preparing several issue area chapters of this comprehensive EIS, Mr. Debauche assisted with the Environmental Justice Analysis (per Executive Order 12898), the Section 4(f) Parklands discussion, and the socioeconomics sections of the EIS. In addition, Mr. Debauche assisted with preparation of a technical report on airport noise effects on nearby housing and mitigation programs for the impacts of the proposed runway.
- **Minneapolis/St. Paul Wastewater Treatment Facility Expansion EIS:** Was a key writer of the EIS for expansion of the existing wastewater treatment facility serving the twin cities area. The studies included alternatives to the project and the long-term effects on the cities of Minneapolis and St. Paul. Mr. Debauche prepared several issue area chapters of this comprehensive EIS, including the Environmental Justice Analysis (per Executive Order 12898), and the socioeconomics sections of the EIS.

PROFESSIONAL ASSOCIATIONS

- American Planning Association (APA), Chapter Member

DECLARATION OF
Michael E. Daly, P.E

I, **Michael E. Daly**, declare as follows:

1. I am presently under contract with Aspen Environmental Group to provide environmental technical assistance to the California Energy Commission. I am serving as a Senior Engineer and to provide Peak Workload Support for the Energy Facility Siting Program and for the Energy Planning Program.
2. My professional qualifications and experience are attached hereto and incorporated by reference herein.
3. I helped prepare the Staff Testimony and errata on **Soil and Water Resources** sections for the Genesis Solar Power Project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony and errata is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and errata and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: February 18, 2010

Signed: _____



At: Tucson, AZ

Education

BS/1992/Hydrology and Water Resources/College of Engineering and Mines,
University of Arizona

Registration

1999/Arizona Registered Professional Engineer/33984
2002/California Registered Professional Engineer/63340

Affiliations

American Water Works Association
Tucson Utilities Contractors Association

Experience

With Psomas for 12 years, with other firms for 5 years.

Background

Mike Daly has more than 17 years of experience in the field of water resource design. He currently manages a five-person team, which completes a variety of project types including watershed and floodplain studies, flood control mitigation studies, sanitary sewer and storm drain planning and design, potable water system planning and design, and utility coordination modifications.

Projects

North Park Improvement Plans, Town of Sahuarita Public Works Department, Sahuarita, Arizona: Mike was project manager for this effort which included preparation of improvement plans for four new effluent infiltration ponds and an adjacent public park consisting of soccer and baseball facilities, playground, and large parking area. A key component of the project was the analysis of offsite flows which were modeled using the FLO-2D due to the topography of the floodplain. The results of the analysis were used to aid the design of the improvements and a proposed conditions model was created and to verify no adverse impacts to adjacent properties due to floodplain encroachment.

Pantano Wash/Kolb Road Permanent Soil Cement Bank Protection, Pima County Regional Flood Control District, Tucson, Arizona: Mike was the Project Manager for this project to develop and compile a basis of design report with alternatives analysis for a permanent bank protection and channel stabilization on the Pantano Wash ($Q_{100}=32,00$ cfs) between Speedway Boulevard and Tanque Verde Road. Services included hydrologic, hydraulic, and sediment transport analysis and documentation for each alternative, as well as geotechnical and structural stability analyses. Soil cement grade control structures were also designed to mitigate and stabilize the Pantano Wash channel and invert from continued head cutting within the project area. Mike is also managing the formal soil cement bank protection design for the project which is currently 90% complete.

Mission West Wash Flood Control Study, Pima County Regional Flood Control District, Pima County, Arizona: As Project Manager, Mike oversaw the hydrologic and hydraulic analysis to assess existing flooding conditions and examine several alternatives to mitigate potential flooding of the San Xavier Estates subdivision. The existing conditions HEC-2 model developed as part of the study was modified to look at the effectiveness of such alternatives as raising an existing berm, widening an existing diversion channel, and constructing a levee to FEMA standards. The option of employing upstream detention was also addressed. Preliminary cost estimates for the various mitigation alternatives were also provided.

Alamo Wash, City of Tucson, Arizona: As Project Manager, Mike's responsibilities included overseeing the re-mapping of the existing floodplain within the project limits using revised 100-year peak discharges. Finished floor elevations (FFE) were collected at all inhabitable structures within the existing FEMA floodplain to determine which structures could be removed from the effective floodplain based on their FFE. The results of the revised mapping and hydrologic analysis were submitted to FEMA in an application for a Letter of Map Revision (LOMR). Mike was also responsible for the preparation of formal design documents for the construction of bank protection for Alamo Wash from just upstream from the confluence with Van Buren Wash to the south side of Grant Road.

Drainage Erosion Mitigation Plan, Pima County Regional Flood Control District, Green Valley, Arizona: As Project Manager Mike contracted with Pima County Regional Flood Control District to provide an erosion mitigation plan at 16 distinct locations within Green Valley. The existing drainage system consists of numerous constructed drainage channels to convey large flows from natural upstream watersheds through developed areas and to the Santa Cruz River. Due to a lack of consideration of sediment transport characteristics during the original design, significant channel downcutting and bank mitigation has occurred in many of the drainageways. Psomas' scope of services included collection of survey data and the formulation of conceptual and formal design plans to be used by contractors to construct mitigation measures and correct existing erosion problems.

Master Drainage Plan, Phases I & II, Town of Sahuarita, Sahuarita, Arizona: As Project Manager, Mike was responsible for this multi-phased effort to identify, characterize, and establish mitigation alternatives for existing drainage problems within the town limits. The study focused on areas where development is occurring or is likely to occur and on the relationship between existing drainage patterns and the future infrastructure required to support this development. Specific tasks included peak discharge analysis, field reconnaissance, assessment of existing drainage infrastructure, conceptual plan development, and preliminary cost estimates.

San Xavier District Master Basin Study, Tohono O'odham Nation Pima County Flood Control District, Pima County, Arizona: As Project Hydrologist, Mike was responsible for the cooperative effort between Pima County and the Tohono O'odham Nation to identify and provide alternatives to mitigate widespread flooding and erosion problems at the reservation. The project scope of work included identification and documentation of existing problems, calculation of peak discharges using HEC-1 methodology, mapping of existing floodplains using HEC-2 methodology, and the

formulation of both structural and non-structural flood control alternatives, which were consistent with the Nation's long term goals and farm rehabilitation plan.

DECLARATION OF
Michael P. Donovan, P.G., C.Hg.

I, **Michael P. Donovan**, declare as follows:

1. I am presently under contract with Aspen Environmental Group to provide environmental technical assistance to the California Energy Commission. I am serving as a Senior Hydrogeologist and to provide Peak Workload Support for the Energy Facility Siting Program and for the Energy Planning Program.
2. My professional qualifications and experience are attached hereto and incorporated by reference herein.
3. I helped prepare the Staff Testimony and errata on **Soil and Water Resources** sections for the Genesis Solar Power Project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony and errata is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and errata and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 1, 2010

Signed:



At: Santa Ana, California

Education

BS/1978/Geology/Oregon State University

Computer Modeling of Groundwater Flow and Contaminant Transport by Jacob Bear/University of California, Irvine

Registration

1986/California Registered Geologist #4112 (Expires 06/30/11)

2000/California Certified Hydrogeologist #701 (Expires 06/30/11)

Experience

With Psomas 5 years; with other firms for 24 years.

Background

Mr. Donovan is a professional hydrogeologist with over 29 years of experience in project management, hydrology and hydrogeological assessments, conceptual model development, groundwater modeling studies, water quality assessments, and groundwater resource development. He has extensive skills with monitoring well design, water quality sampling and analytical techniques, quality assurance/quality control, CEQA, environmental impact assessment, ecohydrology, agency negotiations, risk assessment, and expert witness.

Related Projects

San Juan Basin Authority (2004-Present): Senior Hydrogeologist – Hydrogeologic characterization and monitoring of groundwater extraction as part of desalination facility. Project includes implementation of groundwater monitoring plan including water quality sampling and analytical testing, groundwater modeling, monitoring of surface and groundwater levels and flow and assessments in change in storage to the alluvial groundwater basin from ongoing extraction wells. In addition, evaluated recharge of alluvial groundwater system using diverted stream channels and percolation basins for ongoing desalination project.

Metropolitan Water District of Southern California: Senior Hydrogeologist – Hydrogeologic characterization of bedrock geology in vicinity of proposed Pipeline No. 6 water conveyance tunnel. Work included development of monitoring plan including sampling protocols, laboratory analytical techniques, and quality assurance and quality control procedures.

Private Developer, Hydrogeologic Assessment (2004 to Present): Senior Hydrogeologist - Hydrogeologic characterization of Shaver Valley (east of Indio, CA) for potential conjunctive use project as part of major residential, commercial, and golf resort development in Eastern Riverside County. Work includes workplan development, geophysical investigation, well installation, aquifer testing, water quality assessment, groundwater modeling, conceptual design of groundwater recharge/extraction program, and providing documentation for Specific Plan and EIR.

Mission Springs Water District, Groundwater Modeling Study (2005-Present):

Senior Hydrogeologist –The work included potential historical impacts to regional groundwater system, potential reuse sites for recycled water, and recommendations for a Groundwater Management Plan.

Poseidon Resources, Hydrogeological Assessment: Senior Hydrogeologist – Preparation of Hydrogeological Assessment and Feasibility for the use of vertical extraction wells to supply feedwater for a desalination plant in Southern California. Evaluation included characterization of nearshore hydrogeological regime and design of extraction wells and potential drawdown field created by maximum feasible yield.

Mission Springs Water District, Preliminary Water Balance: Senior Hydrogeologist - Hydrogeologic characterization and water supply assessment for the Mission Springs Water District (MSWD) service area. The objective of this project is to develop a long term Integrated Water Resource Management Plan that can be used by MSWD to optimize the use of their groundwater basins and evaluate alternative water supplies. The alternatives developed must minimize impacts to biological and wildlife of concern by the local environmental community. As part of this project, Mr. Donovan completed a preliminary water balance study for the Mission Creek sub-basin. The results of the study would be used to direct future investigations for the Mission Creek sub-basin.

City of San Juan Capistrano (2007): Senior Hydrogeologist – Assisted the City of San Juan Capistrano in the evaluation of proposed well production sites including installation and testing of pilot test wells at two location. Evaluation included advancement of test borings using Sonic Drilling, well completion, aquifer test, water quality sampling, and preparation of Pilot Test Well Report that included suitability of each location and expected production from a production well placed at each location.

Elsinore Valley Municipal Water District (2006-2007): Senior Hydrogeologist - Meeks & Daley Water Company (M&D) and the City of Riverside constructed two new wells (in City of San Bernardino and Colton). Psomas was responsible for designing and preparing a preliminary design report, construction documents and project specifications for: two new +700-Foot deep wells with a vertical turbine pump assembly at an estimated flow rate of 3,000 GPM and associated piping. Mr. Donovan prepared a Mitigated Negative Declaration, Mitigation Monitoring and Reporting Program, required forms for submittal to State Clearing House, response letter to comments, and presentations to lead agency/public forum on the project.

East Orange County Water District (2008): Senior Hydrogeologist – EOCWD planned to construct a 900-foot deep well (in City of Tustin). Psomas was responsible for designing and preparing a preliminary design report, construction documents and project specifications for the new +900-Foot deep well with a vertical turbine pump assembly at an estimated flow rate of 2,000 GPM and associated piping. Mr. Donovan prepared a Mitigated Negative Declaration, Mitigation Monitoring and Reporting Program, required forms for submittal to State Clearing House, response letter to comments, and presentations to lead agency/public forum on the project.

Surface and Groundwater Assessment, Eastern Utah: Principal investigator for baseline surface water and groundwater assessment and impact monitoring of White

River Shale Corporation major oil shale mining project in eastern Utah. Responsible for locating over 8 surface water monitoring stations, streamflow monitoring (including static and continuous monitoring), development of rating curves for stream cross-sections, water quality sampling, reduction and analysis of data and development of a comprehensive data management system designed after the USGS WASTORE system over a period of seven years. In addition, developed a data quality management system that monitored and corrected deficiencies in the collection and reporting of the surface water quality data and later developed a statistical approach for evaluating mitigation monitoring for naturally-occurring compounds including metals and selected nutrients..

Surface Water Quality Monitoring, Southeast Alaska: Principal investigator for baseline surface water quality monitoring program for the Quartz Hill Molybdenum Project. Responsible for locating over 17 surface water monitoring stations, streamflow monitoring (including static and continuous monitoring), development of rating curves for stream cross-sections, water quality sampling (including storm-activated samplers), reduction and analysis of data and development of a comprehensive data management system designed after the USGS WASTORE system over a period of five years. In addition, developed a data quality management system that monitored and corrected deficiencies in the collection and reporting of the surface water quality data.

Surface Water Quality Monitoring, Thompson Creek Molybdenum Mine, Idaho: Principal investigator for baseline surface water quality monitoring program for a proposed fluorite mine project. Responsible for locating over 12 surface water monitoring stations, streamflow monitoring, water quality sampling, data analysis and reporting of the information over a period of two years.

Surface Water Quality Monitoring, Ima Mine, Idaho: Principal investigator for baseline surface water quality monitoring program for tungsten mine project. Responsible for locating over 5 surface water monitoring stations, streamflow monitoring, water quality sampling, data analysis and reporting of the information over a period of two years.

Surface Water Quality Monitoring, Bayhorse Creek Mine, Idaho: Principal investigator for baseline surface water quality monitoring program for a proposed fluorite mine project. Responsible for locating over 12 surface water monitoring stations, streamflow monitoring, water quality sampling, data analysis and reporting of the information over a period of two years.

Surface and Groundwater Quality Monitoring Program, Equity BX In-situ Oil Shale Mine, Colorado: Principal investigator for mitigation monitoring of surface water and groundwater quality during operation of a pilot test program for steam injection removal of oil from oil shale. Responsible for locating over 4 surface water and 8 groundwater monitoring stations, streamflow monitoring, water quality sampling, data analysis, impact evaluation and reporting of the information.

Surface Water Quality Monitoring, Creede, Colorado: Principal investigator for baseline surface water quality monitoring program for Chevron's proposed silver mine project. Responsible for locating over 12 surface water monitoring stations,

streamflow monitoring, water quality sampling, data analysis and reporting of the information.

Private Developer (2007): Principal Hydrogeologist. Evaluated the feasibility of constructing a golf course and adjacent housing complex on a closed landfill in Riverside County, California. The work included reviewing technical documents, meeting with regulators and developing issues environmental constraints list with recommendation for further study.

Valley Center Residential Project, CA (2005): Senior Hydrogeologist for hydrogeological characterization that included aquifer tests, water quality sampling and analysis, and numeric groundwater flow model development for a proposed residential development project in Valley Center. The project required analyzing the effect of wastewater effluent on the local groundwater aquifer and developing mitigation measures as required.

Sacramento Regional County Sanitation District, Peer Review – Hydrogeological Assessment: Project Manager/Senior Hydrogeologist – Conducted a review documents associated with the dewatering activities conducted during construction activities that occurred at the New Natomas Pump Station and evaluate whether “actual conditions are more adverse than baselines” were present. The evaluation included site walk, review of aquifer testing data and methods, dewatering activities, existing hydrogeological data and preparation of a report on findings.

Mission Springs Water District, Urban Water Management Plan: Senior Hydrogeologist – Preparation of the Hydrogeological portions of an Urban Water Management Plan in compliance with The California Water Management Planning Act of 1983, which required water purveyors to develop water management plans to achieve conservation and efficient use.

Remedial Investigation, Los Angeles, California: Senior Hydrogeologist and Project Manager responsible for interpreting existing information and developing a geologic and hydrogeologic evaluation program for a former chromium-plating facility. The facility is adjacent to a former major manufacturing facility that used chlorinated solvents and hexavalent chromium in its manufacturing operations. Responsibilities included reviewing historical site investigation activities, preparing a remedial investigation workplan, implementation of the workplan, commenting on adjacent facilities’ workplans, California Environmental Protection Agency DTSC meetings and negotiations, and formulating arguments/briefs for impending mediation.

Superfund Oversight, City of Industry, California: Senior Hydrogeologist responsible for participating as the client’s technical representative to the Puente Valley Operable Unit Steering Committee. Responsibilities included reviewing historical site investigation activities and preparing a de minimis argument for the client’s facility, assessing offsite liability stemming from adjacent responsible parties, reviewing proposed activities of the Steering Committee’s consultant, and formulating arguments/briefs for impending mediation.

Remedial Investigation, Redlands, California: Principal investigator for Lockheed Corporation, a rocket motor manufacturing and testing facility. The purpose was to identify potential source areas of TCE contamination. Areas evaluated included burn

pits, leachfields, vapor degreasing units, evaporation ponds, solid propellant mixing areas, rocket motor testing areas, and painting areas. The evaluation involved ranking the potential of various manufacturing activities to act as a source of TCE and evaluating available pathways into existing groundwater systems.

Site Investigation for Southern Pacific Pipeline. Palm Springs, California:

Senior project manager for a site investigation of a fuel leak for this major fuel product transport line. The site investigation included developing soil sampling and field screening techniques, shallow probe installation and groundwater monitoring well installation and sampling. The initial investigation culminated in development of potential remedial alternatives.

Xerox Corporation, Pomona, California: Senior Hydrogeologist for the design, implementation, and interpretation of a remedial investigation of a 12-acre former electronics manufacturing facility. Responsibilities included design and implementation of remedial investigations at the site, operation and maintenance of groundwater treatment system, groundwater monitoring, soil and groundwater cleanup evaluation, regulatory interaction, preparation of demolition specifications, bid documents, selection of subcontractor, and monitoring execution of the demolition program. In addition, provided technical support to outside legal counsel for civil liability lawsuit filed in association with the aforementioned site.

Recovery of Past Investigation Cost Claims, San Diego, California: Senior hydrogeologist for a client who was seeking reimbursement from a previous site operator for site investigation and remedial action costs. Reviewed with legal counsel the costs associated with various activities and segregated into costs that were viable for cost recovery. Provided testimony in court case and was successful in recovering 80% of past costs.

Redevelopment Project, San Diego, California: Project Manager responsible for the environmental assessment associated with the demolition of a bus maintenance facility and construction of multi-story apartment complex at a site severely impacted with petroleum hydrocarbons. The activities included reviewing prior site investigations conducted by five previous consulting firms, delineating areas of concern for excavation activities, conducting focused site investigations on the property, and formulating proposed alternatives for handling petroleum-contaminated soils during site construction.

Xerox Corporation, Santa Clara, Sunnyvale, & Hayward, California: Senior Hydrogeologist for the successful development and implementation of a site closure plan. Responsibilities included interpretation of hydrogeology and contaminant transport, groundwater monitoring, preparation of a site closure plan including hydrogeologic evaluation, fate and transport of chlorinated volatile organic compounds, and negotiations with the regulatory agencies.

Remedial Investigation, Carson, California: Program manager for remedial investigation/feasibility study at a 30-acre chemical-manufacturing site in southern California. The activities conducted at the site included soil vapor surveys, soil sampling, and groundwater sampling (three separate aquifer systems). The program also involved development of a feasibility study work plan, risk assessment evaluation, and public participation plan.

Remedial Investigation, Sacramento, California: Principal investigator for preliminary endangerment assessment and remedial investigation at a large aerospace facility. The 4,000- acre former rocket test facility is currently undergoing soil and groundwater investigations for potential releases of chlorinated solvents and metals. Responsible for developing the remedial investigation tasks and implementation.

Remedial Investigation/Feasibility Study, San Diego, California: Senior hydrogeologist responsible for design and implementation of all site characterization activities including design and implementation of the RI/RFI at a major gas turbine manufacturing facility. The work included assessment of soil and groundwater impacted with chlorinated solvents, metals, benzene, petroleum hydrocarbons and PCBs. Assisted in preparation of a comprehensive RI/RFI work plan that included a historical summary of facility operations, site geology and hydrogeology, and contaminants of concern, and the proposed site characterization activities to be undertaken. Site characterization activities included advancement of borings and completion of wells using hollow-stem auger and casing hammer reverse air circulation drilling; soil vapor surveys; geophysical investigations including electrical and seismic; continuous water level monitoring to correct for tidal influence; and laboratory analysis using CLP protocols.

Six Flags Magic Mountain, Hydrogeological Assessment (2005-2006): Senior Hydrogeologist – Assistance with permitting requirements associated with construction of a bank protection structure along the Santa Clara River in northern Los Angeles County. Work included assessment of hydrogeological regime including water quality, preparation of creekside dewatering permit and negotiations with RWQCB.

Fate and Transport Evaluation, San Diego, California: Senior hydrogeologist for the RI/RFI fate and transport evaluation to determine the necessity for implementing interim remedial measures for the transport of chlorinated volatile organic compounds and metals off-site into marine waters.

Feasibility Study, United States Navy, British Indian Ocean Territories, Indian Ocean (1984): Principal Investigator for enhancing development of groundwater resources on the island of Diego Garcia for the U.S. Rapid Deployment Force. The study included design and placement of horizontal infiltration galleries for development of a fresh groundwater lens.

Publications & Presentations

“Application Of Ecohydrology In Analysis And Minimization Of Development Impacts” Groundwater Resources Association of California 17th Annual Conference & Meeting; GROUNDWATER: Challenges to Meeting Our Future Needs. Sep. 25, 2008

“Hydrogeology of the San Diego Region on CD-ROM”
EnviroConcepts, Inc., March 2004.

“Hydrogeology of the Coastal Plain of Los Angeles on CD, Vol. II”
EnviroConcepts, Inc., March 2004.

“Hydrogeology of the San Fernando Valley on CD-ROM”
EnviroConcepts, Inc., August 2003.

“Hydrogeology of the Inland Plain of Los Angeles on CD-ROM”
EnviroConcepts, Inc., January 2003.

“Hydrogeology of the Coastal Plain of Los Angeles on CD, Vol. I”
EnviroConcepts, Inc., May 2002.

“Environmental Consultants’ Resource Handbook (California Edition).” 600 pp.
EnviroConcepts, Inc., March 1998.

“Environmental Consultants’ Resource Handbook (California Edition).” 561 pp.
EnviroConcepts, Inc., April 1995.

DECLARATION OF John R. Thornton P.E.

I, **John R. Thornton**, declare as follows:

1. I am presently under contract with Aspen Environmental Group to provide environmental technical assistance to the California Energy Commission. I am serving as a Senior Water Resource Engineer and to provide Peak Workload Support for the Energy Facility Siting Program and for the Energy Planning Program.
2. My professional qualifications and experience are attached hereto and incorporated by reference herein.
3. I helped prepare the Staff Testimony and errata on **Soil and Water Resources** sections for the Genesis Solar Power Project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony and errata is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and errata and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 1, 2010

Signed: _____



At: Santa Ana, California

Education

MS/1978/Civil and Environmental Engineering/California State University, Long Beach

BS/1969/Civil Engineering/California State Polytechnic University, Pomona

Registration

1974/Civil Engineer/California/#24251

1976/Agricultural Engineer/California/#145

1982/Civil Engineer/Nevada/#6160

1986/Civil Engineer/Idaho/#5379

1996/Civil Engineer/Arizona/#29954

2007/Civil Engineer/Utah/# 6674175-2202

Affiliations

Water Environment Federation

American Water Works Association

Orange County Water Association

Water Reuse (Vice President of Orange County Chapter)

Urban Water Institute (Member of Board of Directors)

Association of California Water Agency (Member of Groundwater Committee)

Experience

With Psomas for 14 years; with other firms for 27 years.

Background

Mr. Thornton has over 40 years of experience in the development and management of water resource projects ranging in scope and magnitude. He is an expert in the development and management of groundwater development and management projects. He has been in responsible charge of the preparation of feasibility studies and facilities master plans; preliminary and final design documents (construction drawings, specifications, and cost estimates); and construction supervision of canals, pipelines, wells, pump stations, reservoirs, reclaimed water use systems, and agricultural crop and landscaping irrigation facilities. He has also provided technical studies and expert witness testimony in complex water rights matters. The following are examples of projects he has been in principal charge:

Projects

San Juan Basin Authority, San Juan Capistrano, Ca (1990 to Present): District Engineer and Project Manager for the San Juan Basin Authority. Principal author of the 1994 groundwater management plan and water rights application that lead to obtaining a water Rights Permit to develop groundwater from the San Juan and Arroyo Trabuco Creeks and construction of the City of San Juan Capistrano's brackish water desalination plan. Successfully applied for and obtained four grants from CSWRCB. One of the grants was used to develop the Integrated Vegetation and Groundwater Monitoring Plan which was reviewed and accepted by the Division of Water Rights as meeting all of the

monitoring conditions of the water rights permit not only for the SJBA but also the requirements of the South Coast Water District Water Rights Permit. Implemented and provided overall management of the implementation of the Integrated Vegetation and Groundwater Monitoring Plan since its inception in 2004. Have successfully modified and or reduced several of the monitoring protocols as they were not applicable to the conditions within the monitoring area. Have provided water resource and engineering consulting expertise to the SJBA on numerous project since 1990.

Mission Springs Water District, Integrated Water Resource Plan: Principal in Charge to assist MSWD staff in the preparation of an Integrated Water Resource Plan and further develop a conceptual understanding of the conjunctive use and groundwater banking options potentially available in various locations within their service area. The first phase of the project focused on the development of a hydrologic water balance for the Mission Creek Sub-basin. Psomas' initial review resulted in the development of a comprehensive field investigation plan and implementation plan for a variety of alternatives that incorporated the water resource supply needs for future projected demands. The objective of the work effort was to address specific groundwater management options for the utilization and conservation of existing and potential water resources available to MSWD.

South Orange County Integrated Water Shed Management Plan: Principal in Charge of developing an IRWMP for South Orange County as part of the California Prop 50 and 84 bond financing program. The plan included the coordination of over 20 public agencies and stakeholders, the development of a plan with over 40 million dollars in projects largely related to water and wastewater development.

Antelope Valley Groundwater Banking Feasibility Study: Project Manager for investigating the feasibility of developing a conjunctive use project to facilitate the sale of State Project waters exchanged for banked groundwater in the westerly Antelope Valley of Los Angeles County. The banked groundwater would be sold to Los Angeles Department of Water and Power to replace water used for dust mitigation at the Owens Lake. The study reviewed the geologic, hydrogeologic, water supply, water quality, costs, environmental and institutional issues associates with the project; determined appropriate water supply, recharge, recovery and storage criteria; sized the facility and prepared cost estimates. A preliminary MODFLO model was developed. Operational criteria was developed for 20,000 to 40,000 acre feet per year of recharge, up to 40,000 acre feet of extraction, 200,000 acre feet of cumulative storage and service to and from both water supply facilities.

Hemet/San Jacinto Recharge and Recovery Program, Eastern Municipal Water District, CA: Project Director/Principal-in-Charge for the Eastern Municipal Water District Integrated Recharge and Recovery Program. Psomas worked with the EMWD and local stakeholders to evaluate the feasibility of using EMWD-owned property in the San Jacinto River bed as an integrated groundwater storage site. The feasibility program includes the analysis and evaluation of hydrogeologic properties, development of a regional groundwater model, preliminary design and location of proposed recharge basins and necessary facility infrastructure including extraction wells. In addition, coordination

coordination was provided for environmental support services for the EMWD overall Habitat Conservation Plan for this project and discussing the project with appropriate regulatory agencies such as the Army Corps of Engineers and United States Fish and Wildlife. The purpose of the proposed Program is to provide groundwater storage within the eastern portion of EMWD's service area (i.e., the Hemet/San Jacinto area).

Olancho Water Project, CA, Western Water Co: Project Manager for developing facilities and evaluating the feasibility of a water transfer project from the Southern Owens Valley, Owens Lake area. The project includes the development of a groundwater flow model (ModFlow) for approximately a fifty square mile area of the southern Owens Lake, evaluation of groundwater hydrogeology, evaluation of impacts to natural and cultural resources, location and preliminary design of facilities, including wells, pipelines and connection to the City of Los Angeles Owens Valley Aqueducts and overall project feasibility. Approximately 10,000 acre feet per year were estimated as feasible to extract from the groundwater without impacting farming, domestic water and natural resources. A complete EIR was developed including all necessary biological and cultural studies and initial processing through the planning department of Inyo County. A groundwater resource-monitoring plan was developed and implemented for monitoring water level and quality for over 20 wells in the surrounding area. The project was performed under careful review of the Inyo County Water Department.

Cadiz/Fenner Conjunctive Use and Storage Program, San Bernardino County, CA, Cadiz Land Co.: Project Manager for the development of preliminary engineering and economic analysis for a conjunctive use, water storage and transfer program located in Cadiz and Fenner Valleys of San Bernardino County. The project included 30 miles of large diameter pipeline. The Core Program could provide a dry-year water supply to the Metropolitan Water District of Southern California of up to 100,000-acre feet per year. The program concept is to convey Colorado River water from the Colorado River Aqueduct (CRA) to the Cadiz/Fenner area during periods of excess supply. The imported water would be stored in the local groundwater aquifer system. This water and indigenous groundwater would be extracted by wells and returned to the CRA during periods of drought.

DECLARATION OF Candace M. Hill

I, Candace M. Hill, declare as follows:

1. I am presently employed by the California Energy Commission in the Environmental Protection Office of the Siting, Transmission, and Environmental Protection Division as a Planner II.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony and errata on the Traffic and Transportation section for the **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony and errata is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and errata and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated:_____ Signed:_____

At: Sacramento, California

CANDACE M. HILL

PROFESSIONAL EXPERIENCE

CALIFORNIA ENERGY COMMISSION - December 2009 – Present

Siting, Transmission, and Environmental Protection Division, Sacramento, California

Environmental Planner II

- Review applications for power plants and solar electric generating facilities for transportation, land use, visual, and socioeconomic impacts.
- Write environmental analysis staff assessments.
- Attend workshops on authored technical sections.

DEPARTMENT OF TRANSPORTATION - December, 2008 – December, 2009

Division of Mass Transportation, Sacramento, California

Associate Transportation Planner

- Administered two Federal Transit Administration (FTA) Grant Programs – Job Access and Reverse Commute (JARC) and New Freedom (NF).
- Reviewed and assessed grant proposals, monitored and prepared weekly and bi-weekly status reports for both Programs, managed the day-to-day operations of the grants and budgets for transportation, capital, operating and mobility management grants administered through the Department of Transportation for District 4 and District 5 which covered 14 counties.
- Responded to inquiries from grant recipients and the general public regarding the grants.

DEPARTMENT OF CONSERVATION - May, 2000 – December, 2008

California Geological Survey, Sacramento, California

Associate Planner

- Met with staff of the planning, building, public works and engineering departments of affected cities and counties throughout the State to explain the requirements and implementation of the California Seismic Hazards Mapping Act in the land use development process such as the General Plan, Zoning Code, building process and the California Environmental Quality Act.
- Analyzed and commented on General Plan Draft Safety Elements to incorporate the Seismic Hazard Zone Maps into the Element; reviewed Tribal Land Applications for seismic impacts.
- Presented the Seismic Hazard Zone Maps before the State Mining and Geology Board and coordinated with the public affairs office, legislative office and other state departments regarding the issuance of the Seismic Hazard Zone Maps.
- Maintained a database of affected cities and counties.
- Point person for outreach events.
- Responded to public inquiries regarding Zone Maps and general seismic hazards.

CANDACE M. HILL

SACRAMENTO COUNTY PLANNING DEPARTMENT July, 1999– May, 2000

Current Planning, Sacramento, California

Associate Planner

- Researched, analyzed and wrote staff reports for land use development proposals.
- Presented staff reports and recommendations for the land use development proposals to the Sacramento County Planning Commission and Sacramento Board of Supervisors.
- Staff Planner for the Cosumnes Community Planning Advisory Council.
- Supervised one Assistant Planner.
- Assisted the public with zoning, planning and general questions via the public counter, telephone and e-mail.

STANISLAUS COUNTY PLANNING DEPARTMENT – December, 1996 – July 1999

Current Planning, Modesto, California

Associate Planner

- Researched, analyzed and wrote staff reports for land use development proposals.
- Prepared Initial Studies and associated documents per the California Environmental Quality Act.
- Presented staff reports and recommendations for the land use development proposals to the Stanislaus County Planning Commission.
- Assisted the public with zoning, planning and general questions via the public counter and telephone.

IMPERIAL COUNTY PLANNING AND BUILDING DEPARTMENT - October, 1990 – December, 1996

Current Planning, El Centro, California

Planner III

- Researched, analyzed and wrote staff reports for land use development proposals.
- Prepared Initial Studies and associated documents per the California Environmental Quality Act.
- Assisted the public with zoning, planning and general questions via the public counter and telephone.

EDUCATION

University of California, Riverside

Bachelor of Arts in Administrative Studies – 1989

DECLARATION OF

Dr.Obed Odoemelam

I, **Obed Odoemelam** declare as follows:

1. I am presently employed by the California Energy Commission in the Facilities Siting, Transmission, and Environmental Protection Division as a Staff Toxicologist.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **Transmission Line safety and Nuisance** for Genesis Solar Energy Project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated:_____ Signed:_____

At: Sacramento, California

RESUME

DR. OBED ODOEMELAM

EDUCATION:

1979-1981 University of California, Davis, California. Ph.D., Ecotoxicology

1976-1978 University of Wisconsin, Eau Claire, Wisconsin. M.S., Biology.

1972-1976 University of Wisconsin, Eau Claire, Wisconsin. B.S., Biology

EXPERIENCE:

1989

The Present: California Energy Commission. Staff Toxicologist.

Responsible for the technical oversight of staffs from all Divisions in the Commission as well as outside consultants or University researchers who manage or conduct multi-disciplinary research in support of Commission programs. Research is in the following program areas: Energy conservation-related indoor pollution, power plant-related outdoor pollution, power plant-related waste management, alternative fuels-related health effects, waste water treatment, and the health effects of electromagnetic fields. Serve as scientific adviser to Commissioners and Commission staff on issues related to energy conservation. Serve on statewide advisory panels on issues related to multiple chemical sensitivity, ventilation standards, electromagnetic field regulation, health risk assessment, and outdoor pollution control technology. Testify as an expert witness at Commission hearings and before the California legislature on health issues related to energy development and conservation. Review research proposals and findings for policy implications, interact with federal and state agencies and industry on the establishment of exposure limits for environmental pollutants, and prepare reports for publication.

1985-1989 California Energy Commission.

Responsible for assessing the potential impacts of criteria and noncriteria pollutants and hazardous wastes associated with the construction, operation and decommissioning of specific power plant projects. Testified before the Commission in the power plant certification process, and interacted with federal and state agencies on the establishment of environmental limits for air and water pollutants.

1983-1985 California Department of Food and Agriculture.

Environmental Health Specialist.

Evaluated pesticide registration data regarding the health and environmental effects of agricultural chemicals. Prepared reports for public information in connection with the eradication of specific agricultural pests in California.

DECLARATION OF
JAMES EARL JEWELL

I, James Earl Jewell, declare as follows:

1. I am currently under contract with the Aspen Environmental Group to provide environmental technical assistance to the California Energy Commission. Under Contract No. 700-05-002 I am serving as an Illuminating Engineer to provide Peak Workload Support for the Energy Facility Siting Program and for the Energy Planning Program.
2. A copy of my professional qualifications and experience is attached hereto and incorporated herein.
3. I assisted in the preparation of the final staff testimony on Visual Resources for the Genesis Solar Energy Project based on my independent analysis of the Application for Certification and supplements thereto, data from reliable sources and documents, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is accurate and valid with respect to the issues addressed therein.
5. I am familiar personally with the facts and conclusions applicable to matters of intrusive light and glare and relative brightnesses, and if called as a witness, could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of
of
my knowledge and belief.

Dated: 22 March, 2010---- Signed: _____

At: San Francisco, California

JAMES EARL JEWELL, LC, ATF, IES, CIES (Hon), SAH

EDUCATION:

BA, College of the Pacific
MFA, School of Drama, Yale University

EMPLOYMENT:

1957-67, Engineering Division, Holzmüller Corporation
1967-69, Theatre Consulting Service, Bolt, Beranek & Newman
1969-87, Lighting Services Administrator, Pacific Gas & Electric Company
1987- present, Consultant in Lighting
Since 1993 in association with Alan Lindsley, AIA, IES

PROFESSIONAL ACTIVITIES:

Illuminating Engineering Society
President – 1984-85
Vice President – 1983-84
Director – 1979-86
Office Lighting Committee – 1976 - present, Chairman, 1978-80
Roadway Lighting Committee – 1974 – present, Chairman, 1990-92
Regional Energy Committee Chairman – 1974-76, 1978-84
Energy Advisory Committee – 1973-75
Technical Missions – China – 1984, 1987, 1988

European Lighting Congress: Strasbourg, 1969; Florence, 1977; Granada, 1981;
Lausanne, 1985; Budapest, 1989; Edinburgh, 1993; Berlin, 2001

Pacific Basin Lighting Congress: Chairman, Shanghai, 1989; Bangkok, 1993;
Nagoya, 1997; Organizing Committee, Delhi, 2002; Cairns, 2005; Bangkok,

2009

Edison Electric Institute: Street Lighting Committee – 1971-87, Chairman 1979-81

International Commission on Illumination:

Board of Administration – 1983-87, 1987-91
Division Four (Lighting for Transport)
Technical Committee 4.34 -- 1980-95
Technical Committee 4.25 -- 1992-99

Professional Light Designers Convention: London, 2007; Berlin, 2009

EXPERT WITNESS – Admitted as an expert witness in the Superior Courts of Amador,
Contra Costa, and San Francisco Counties.

AWARDS AND HONOURS:

IES Regional Technical Award – 1985
IES Distinguished Service Award – 1986
College of Fellows of the American Theatre --1988
Honourary Member, China IES – 1989
CIE Distinguished Service Award – 1991
IES Louis B. Marks Award – 1993

CERTIFICATION:

LC – Granted in 1990 by the National Council on the Qualification of Lighting Professionals

RELEVANT WORK EXPERIENCE:

With PG&E appeared before CEC Committee and Staff on lighting issues with respect to the siting and licensing of Geysers steam power plants.

On behalf of PG&E and the IES appeared before the Simonson Committee to consult on the development of the lighting portions of Title 24.

On behalf of PG&E and the IES appeared before the CEC on numerous occasions to support the development of fluorescent lamp promotional programs and to assist in developing rigorous lighting ballast standards for California and on other lighting energy management issues.

While at PG&E supported and oversaw funding for projects on daylight following and electronic ballasts. Projects supported by both the DOE and CEC.

In practice as a lighting consultant worked with private clients and jurisdictions on matters concerned with light trespass and “intrusive” lighting.

JEJewell
19 February 2010

DECLARATION OF William D. Kanemoto

I, William Kanemoto, declare as follows:

1. I am presently under contract with Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division. I am serving as a Visual Resource Specialist to provide Peak Workload Support for the Energy Facility Siting Program and for the Energy Planning Program.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared staff testimony on Visual Resources for the **Genesis Solar Project** based on my independent analysis of the Application for Certification and supplements hereto, data from documents and sources deemed to be reliable, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.
5. I am personally familiar with the facts and conclusions applicable to the vapor plume simulations and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 18, 2010

Signed: 

At: Oakland, California

William Kanemoto

Visual Resource/Aesthetics Analyst

Academic Background:

M. Landscape Architecture, University of Michigan, Ann Arbor, 1982
B.A. Liberal Arts (Honors), University of California, Santa Cruz, 1973

Professional Experience:

Principal

William Kanemoto & Associates, Oakland, California, 1993 - Present

William Kanemoto is Principal of William Kanemoto & Associates, an environmental consulting practice specializing in visual analysis and computer visualization in the context of environmental review. In this capacity he has served as principal investigator for visual analysis and simulation on a wide range of major infrastructure and development projects, including the High Desert Power Project AFC, Port of Oakland Expansion EIS, Route 4 East/Pittsburg BART EIS, FMC Substation and Transmission Line PEA, and numerous other infrastructure and transportation projects. Mr. Kanemoto received recognition from the California Association of Environmental Professionals for visual analysis, computer simulation, animation, and video production for the Stanford Sand Hill Road Projects EIR, prepared by EIP Associates and judged 'Best State-Wide EIR of 1997'.

Associate Director

Environmental Simulation Laboratory,
Institute of Urban and Regional Development,
Center for Environmental Design Research
University of California, Berkeley, 1994 - 2000

Instructed graduate students in the College of Environmental Design, U.C. Berkeley, served as consultant on various major planning projects in the San Francisco Bay Area, and conducted design collaborations with counterparts at Keio University and ARK CyberUniversity in Tokyo, Japan via the Internet.

Principal Investigator/Project Manager

Dames & Moore, San Francisco/Oakland, California, 1988-1992

Served as principal investigator of numerous visual analyses of major infrastructure projects throughout the U.S., in Europe, and in Asia. Gained extensive familiarity with the application of a wide range of professionally accepted visual assessment techniques in the context of CEQA, NEPA, and related regulatory requirements of the CPUC, CEC, FERC, DOT, U.S. Forest Service, BLM, and other agencies.

Project Manager

LSA Associates, Pt. Richmond, California, 1987-1988

Project manager and planner on environmental impact reports for various residential and commercial development projects in northern California.

Environmental Planner

Holton Associates, Berkeley, California, 1984-1987

Preparation of various resource and regulatory studies including EIRs, FERC Exhibit E, Section 404 alternative analyses, riparian restoration studies, and cumulative impact methodology studies for EPRI and Sierra County, CA.

DECLARATION OF James Thurber

I, James Thurber, declare as follows:

1. I am presently under contract with Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division. I am serving as a Geologist to provide Peak Workload Support for the Energy Facility Siting Program and for the Energy Planning Program.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared staff testimony on Waste Management for the **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements hereto, data from documents and sources deemed to be reliable, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.
5. I am personally familiar with the facts and conclusions applicable to the vapor plume simulations and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 23, 2010

Signed: 

At: Lake Forest, California

STATEMENT OF QUALIFICATIONS

JAMES E. THURBER Professional Hydrogeologist

Mr. Thurber is a highly qualified hydrogeologist, experienced in the development of municipal water supply resources. His expertise encompasses the ability to assess the hydrogeology of groundwater basins; define aquifer characteristics; select water well sites; design water wells; and manage construction of wells. Mr. Thurber is actively involved in water resource evaluations related to groundwater recharge and recovery and use of groundwater with impaired water quality. He is experienced with groundwater modeling and assessment of water quality issues. He is well versed in the interpretation of stratigraphic and geophysical logs for final selection of screened intervals and gravel pack during well construction to optimize sand-free groundwater production. Mr. Thurber is experienced in monitoring construction of the well to confirm accurate placement of the well screen, gravel pack and seals. He is experienced in the analysis of pumping test results to define production levels and develop recommendations for operation and maintenance as well as water quality monitoring. He is also experienced in water quality sampling by aquifer isolation methods. Mr. Thurber is experienced in hazardous waste investigations and has performed hazardous material and groundwater contamination assessments.

REGISTRATION

Registered Geologist, California
Certified Engineering Geologist, California
Certified Hydrogeologist, California

EDUCATION

Colorado State University, M.S., Geology, 1982
California State University, Northridge, B.S., Geology, 1978
California State University, Northridge, B.A., Geography, 1976

MEMBERSHIPS

National Ground Water Association
American Water Works Association

EXPERIENCE

GEOTECHNICAL CONSULTANTS, INC. Joined the firm in 1985. Mr. Thurber is assisting Orange County Water District with the design and construction management of new injection wells on the Talbert Seawater Intrusion Barrier. Mr. Thurber was the project hydrogeologist for the San Pasqual Groundwater Basin study performed for the City of San Diego, responsible for selection of existing agricultural wells for pump testing, construction of observation wells, pump testing, data collection and analysis to determine aquifer parameters. Mr. Thurber developed the well field design for the San Pasqual Water Resources Management Plan, a groundwater replenishment project that uses a series of injection and extraction wells to store reclaimed water and recover it for potable use. He has developed groundwater flow models for the assessment of longterm pumping, sustained yield, and water quality impacts. Mr. Thurber has performed geologic logging, well design, construction observation, development and pump testing of over 40 high-capacity supply wells. He has developed and implemented plans for rehabilitation of biologic induced well fouling. Mr. Thurber was the project manager for the Irvine Desalter Project including well design and aquifer testing of four new production wells. Mr. Thurber was project manager for drilling 18 test holes and design, construction and pump testing of 9 extraction wells and 8 monitoring wells for the Northeast Disposal Area, George Air Force Base. He has conducted aquifer characterizations at major landfills in southern California. He has participated in a number of hydrogeologic assessments to evaluate contamination from leaking underground tanks or other sources.

Municipal Water Wells

Well No. 125, City of Westminster, California
Sebastapol Road and Occidental Road Emergency Supply Wells, Sonoma
County Water Agency, Santa Rosa, California
Well Nos. 19, 20, 21, 22, 23, 24 and 25, City of Orange, California
Well No. 1B, No. 8, No. 9 and No. 11, Mesa Consolidated Water District,
Costa Mesa, California
Water Well Rehabilitation, Mesa Consolidated Water District, Well Nos. 4, 5, 7
and 8, Costa Mesa, California
Vandenberg Well, City of Tustin, California
Well IDP-1, IDP-2, IDP-3 and IDP-4, Irvine Desalter Project,
Orange County Water District, California
Ball and Boisseranc Wells, Buena Park, California
Wells 2201 and 2363, USMC Camp Pendleton Air Base, Oceanside, California

Valley Well No.2, San Diego Wild Animal Park, San Pasqual Valley,
Escondido, California
Camanche North Shore Water Well, East Bay MUD, Amador County, California

Groundwater Injection Wells

Talbert Seawater Intrusion Barrier, I24, I25 and I26, Orange County Water
District, Fountain Valley, California

Groundwater Monitoring, Site Characterization Studies

Newport Mesa Multi-Aquifer Monitoring Wells M39 and M40, Orange County
Water District, Costa Mesa, California
Maderas Golf Course, Poway, California
North Shore Camp, Lake Camanche, Amador County, California
San Pasqual Valley, San Diego, California
Mesa Consolidated Water District/Orange County Water District,
Deep Multi-Port Monitoring Well, Costa Mesa, California
Calabasas Landfill, Calabasas, California
Puente Hills Landfill, Whittier, California
Los Alamitos AFRC Landfill, Los Alamitos, California
Norwalk Dump, Norwalk, California
Stinnes-Western Chemical Corporation, Vernon, California
Cooper Drum Company, South El Monte, California
George Air Force Base, Adelanto, California
Castrol, Inc., Los Angeles, California
Palomar Airport Landfill, Carlsbad, California

Leaking Underground Fuel Tanks

Orange Fire Station, Orange, California
California Industrial Products, Santa Fe Springs, California
Rexnord-Tridair Industries, Torrance, California
W. A. Woods Industries, South Gate, California
Property Management Systems, Santa Ana, California
Burch Ford, La Habra, California
Kaama Marine Engineering, Costa Mesa, California

Groundwater Related Technical Studies for Environmental Impact Reports

North County Landfill Siting Study, San Diego County, California
Imperial Redevelopment Project, San Diego, California
Cajon Pipeline, San Bernardino and Los Angeles Counties, California
Pacific Pipeline, Santa Barbara, Ventura and Los Angeles Counties,
California
Santa Fe Pacific Partners Pipeline, Carson to Norwalk, California

DECLARATION OF SHAHAB KHOSHMAHRAB

I, **SHAHAB KHOSHMAHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Facilities Siting Division as a **MECHANICAL ENGINEER**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I participated in the preparation of the staff testimony on **Facility Design** for the **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____

Signed: _____

At: Sacramento, California

DECLARATION OF SHAHAB KHOSHMAHRAB

I, **SHAHAB KHOSHMAHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Facilities Siting Division as a **MECHANICAL ENGINEER**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I participated in the preparation of the staff testimony on **Power Plant Efficiency** for the **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____

Signed: _____

At: Sacramento, California

DECLARATION OF SHAHAB KHOSHMAHRAB

I, **SHAHAB KHOSHMAHRAB**, declare as follows:

1. I am presently employed by the California Energy Commission in the **ENGINEERING OFFICE** of the Facilities Siting Division as a **MECHANICAL ENGINEER**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I participated in the preparation of the staff testimony on **Power Plant Reliability** for the **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____

Signed: _____

At: Sacramento, California

Shahab Khoshmashrab
Mechanical Engineer

Experience Summary

Nine years experience in the Mechanical, Civil, Structural, and Manufacturing Engineering fields involving engineering and manufacturing of various mechanical components and building structures. This experience includes QA/QC, construction/licensing of electric generating power plants, analysis of noise pollution, and engineering and policy analysis of thermal power plant regulatory issues.

Education

- California State University, Sacramento-- Bachelor of Science, Mechanical Engineering
- Registered Professional Engineer (Mechanical), California

Professional Experience

2001-2004--Mechanical Engineer, Systems Assessment and Facilities Siting-- California Energy Commission

Performed analysis of generating capacity, reliability, efficiency, noise and vibration, and the mechanical, civil/structural and geotechnical engineering aspects of power plant siting cases.

1998-2001--Structural Engineer -- Rankin & Rankin

Engineered concrete foundations, structural steel and sheet metal of various building structures including energy related structures such as fuel islands. Performed energy analysis/calculations of such structures and produced structural engineering detail drawings.

1995-1998--Manufacturing Engineer -- Carpenter Advanced Technologies

Managed manufacturing projects of various mechanical components used in high tech medical and engineering equipment. Directed fabrication and inspection of first articles. Wrote and implemented QA/QC procedures and occupational safety procedures. Conducted developmental research of the most advanced manufacturing machines and processes including writing of formal reports. Developed project cost analysis. Developed/improved manufacturing processes.

DECLARATION OF
Testimony of Dal Hunter, Ph.D., C.E.G.

I, **Dal Hunter, Ph.D., C.E.G.**, declare as follows:

1. I am presently employed as a subcontractor to Aspen Environmental Group, a contractor to the California Energy Commission, Systems Assessment and Facilities Siting Division, as an engineering geologist.

2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

3. I helped prepare the staff testimony on **GEOLOGY AND PALEONTOLOGY** for the proposed **Genesis Solar Energy Project** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.

4. It is my professional opinion that the prepared testimony and changed Condition of Certification is valid and accurate and comports with my prior written testimony in the Final Staff Assessment.

5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: March 24, 2010

Signed: 

At: Black Eagle Consulting, Inc.

Reno, Nevada



exp 3.31.11

Robert D. Hunter, Ph.D., C.E.G.

Engineering Geologist

Vice President

Education

- Ph.D. – Geology – 1989 – University of Nevada, Reno
- M.S. – Geology – 1976 – University of California - Riverside
- B.S. – Earth Science – 1972 – California State University, Fullerton

Registrations

- Professional Geological Engineer – Nevada
- Registered Geologist – California
- Certified Engineering Geologist – California

Experience

1997 to Present: Black Eagle Consulting, Inc.; Vice President. Dr. Hunter is in charge of all phases of geochemical, geological, and geotechnical projects and is responsible for conducting, coordinating, and supervising geotechnical investigations for public and private sector clients. He is very familiar with design specifications and state and federal requirements.

Dr. Hunter has also provided geological, geotechnical, and paleontological review and written and oral testimony for California Energy Commission (CEC) power plant projects including:

- El Segundo Power Redevelopment Project (Coastal, including testimony and compliance monitoring)
- Magnolia Power Project (including compliance monitoring)
- Ocotillo Energy Project (Wind Turbines)
- Vernon-Malburg Generating Station
- Inland Empire Energy Center (including testimony and compliance monitoring)
- Palomar Energy Project
- Henrietta Peaker Project
- East Altamont Energy Center
- Avenal Energy Center
- Teayawa Energy Center monitoring
- Walnut Energy Center (including compliance monitoring)
- Riverside Energy Resource Center
- Salton Sea Unit 6 (Geothermal Turbines)
- National Modoc Power Plant
- Pastoria Energy Center
- Sun Valley Energy Project
- El Centro Unit 3 Repower Project
- AES Highgrove Project
- South Bay Replacement Project
- Vernon Power Plant

- Humboldt Bay Repowering Project
- Victorville Power Project
- Carlsbad Energy Center
- San Gabriel Generating Station
- Orange Grove
- Chula Vista Energy Upgrade
- Carrizo (Solar)
- Kings River
- Canyon Power Plant
- Otay Mesa Generating Project (compliance monitoring)
- Mountainview Power Plant Project (compliance monitoring)
- Consumes Power Plant (compliance monitoring)
- Sunrise Power Project (compliance monitoring)
- Niland Power Project (compliance monitoring)
- Panoche Power Plant (compliance monitoring)

Attended Expert Witness Training Sponsored by CEC.

1978 to 1997: SEA, Incorporated; Geotechnical Manager, Engineering Geologist. Dr. Hunter was in charge of all phases of geotechnical projects for SEA, including project coordination and supervision, field exploration, geotechnical analysis, slope stability analysis, soil mechanics, engineering geochemistry, mineral and aggregate evaluations, and report preparation. Numerous investigations were undertaken on military, commercial, industrial, airport, residential, and roadway projects. He worked on many geothermal power plants, providing expertise in foundations design, slope stability, seismic assessment, geothermal hazard evaluation, expansive clay, and settlement problems. Project types included high-rise structures, airports, warehouses, shopping centers, apartments, subdivisions, storage tanks, roadways, mineral and aggregate evaluations, slope stability analyses, and fault studies.

1977 to 1978: Fugro (Ertec) Incorporated Consulting Engineers and Geologists; Staff Engineering Geologist; Long Beach, California.

Affiliations

- Association of Engineering Geologists

Publications

- Hunter, 1988, *Lime Induced Heave in Sulfate Bearing Clay Soils*, Journal of Geotechnical Engineering, ASCE, Vol. 14, No. 2, pp. 150-167.
- Hunter, 1989, *Applications of Stable Isotope Geochemistry in Engineering Geology*: Proceedings of the 25th Annual Symposium on Engineering Geology and Geotechnical Engineering.
- Hunter, 1993, *Evaluation of Potential Settlement Problems Related to Salt Dissolution in Foundation Soils*: Proceedings of the 29th Annual Symposium on Engineering Geology and Geotechnical Engineering.

DECLARATION OF Mark Hesters

I, **Mark Hesters**, declare as follows:

1. I am presently employed by The California Energy Commission in the **Siting, Transmission and Environmental Protection Division** as a Senior Electrical Engineer.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I prepared the staff testimony on **Transmission System Engineering**, for the **Genesis Solar Energy Project**, based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issues addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____ Signed: _____

At: Sacramento, CA _____

Mark Hesters
Associate Electrical Engineer

Mark Hesters has fourteen years of experience in electric power regulation. He worked in the Engineering Office of the California Energy Commission's Energy Facilities Siting & Environmental Protection Division since 1998 providing analysis of California transmission systems and testimony on transmission systems in several Commission power plant certification processes. Prior to that Mark worked in the CEC's Electricity Analysis Office providing lead analysis on Southern California Edison resource issues and modeling support for all areas of California. He holds a B.S. degree from the University of California at Davis in Environmental Policy Analysis and Planning.

DECLARATION OF

Sudath Edirisuriya

I, Sudath Edirisuriya declare as follows:

I am presently employed by the California Energy Commission in the Engineering Office of the Systems Assessments and Facilities Siting Division as an Electrical Engineer.

A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.

I helped prepare the staff testimony on Transmission System Engineering for the Genesis Solar Energy Project based on my independent analysis and supplements thereto, data from reliable documents and sources, and my professional experience and knowledge.

It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue(s) addressed therein.

I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Date: March 23, 2010. Signed: Sudath Edirisuriya

At: Sacramento, California

Sudath A. Edirisuriya
1916 Ackleton Way
Roseville CA 95661

Phone 916-654-4851

EDUCATION:

Bachelor of Science in Electrical Engineering at California State University Fullerton

ATTAINMENTS:

Member of the Professional Engineers in California Government

Vice President Electrical Engineering Society-California State University Fullerton.

EXPERIENCE:

November-2001 to Present: - Associate Electrical Engineer, System Assessment and Facilities Siting Division, California Energy Commission.

Working in the Transmission System Engineering unit on licensing generation projects. Work involves evaluating generation interconnection studies (SIS and FS), their reliability and environmental impacts on transmission system, preparing staff assessment reports, presenting testimony. Perform reliability studies and coordinating data and technical activities with utilities, California ISO and other agencies. Conduct and perform planning studies and contingency analysis including power flow, short-circuit, transient, and post-transient analysis to maintain reliable operation of the power system. Understanding of regulatory and reliability guidelines, WECC and NERC planning and operation criteria, CPUC and FERC requirements. Review technical analyses for WECC/CA ISO/PTO transmission systems and proposed system additions; and provide support for regulatory filings.

June-1998 to November-2001: - Project Electrical Engineer, Design Electrical Engineering Section, Department of Transportation, California.

Electrical Engineering knowledge and skills in the design, construction and maintenance of California state work projects involving all the public work areas; contract administration, construction management, plan checking, field engineering and provide liaison with consultants, developers, and contractors. Plan review in facility constructions, highway lighting, sign lighting, rest area lighting, preparation of project reports, cooperative agreements, review plans for compliance of construction and design guide lines for national electrical code, standards and ordinance. Review process included breaker relay coordination, detail wiring diagrams, layout details, service coordination, load, conductor sizes, derated ampacity, voltage drop calculations, harmonic and flicker determination.

June-1993 to May-1998:- Substation Electrical Engineer, City of Anaheim, California.

Performed protective relay system application, design and setting determination in Transmission & Distribution Substation. Understanding of principles of selective coordination system protection and controls for Electric Utility Equipment. Understanding of Power theory and Analysis of symmetrical components. Ability to review engineering plans, specifications, estimates and computation for Electrical

Utility Projects. Practices of Electrical Engineering design, to include application of Electro-mechanical and solid state relays in Electrical Power Systems. Software skills in RNPDC (Fuse Coordination Program), Capacitor Bank allocation program, and GE Load Flow Program. Design projects using CAD, Excel spread sheets including cost estimates, wiring diagrams, material specifications and field coordination.

Performed underground service design 12kV and 4kV duct banks; pole riser; getaway upgrade; voltage drop calculation, ampacity calculation and wiring diagrams. Design and maintenance of substations in City Electrical Utility System. Upgrade Station Light and power transformers; upgrade capacitor banks; replacement of 12kV-4kV power circuits; Breakers at Metal Clad Switchgear. Design one-line diagrams; three line diagrams; grounding circuits; schematics; coordination of relay settings; conduit and material list preparation. Calculation of derated ampacity; inrush current, short circuit current.

DECLARATION OF MARY DYAS

I, **MARY DYAS** declare as follows:

1. I am presently employed by the California Energy Commission in the **SITING AND COMPLIANCE OFFICE** of the Siting Transmission and Environmental Protection Division as a **COMPLIANCE PROJECT MANAGER**.
2. A copy of my professional qualifications and experience is attached hereto and incorporated by reference herein.
3. I helped prepare the staff testimony on **JOINT AGENCY GENERAL CONDITIONS INCLUDING COMPLIANCE MONITORING AND CLOSURE PLAN**, for the **GENESIS SOLAR ENERGY PROJECT** based on my independent analysis of the Application for Certification and supplements hereto, data from reliable documents and sources, and my professional experience and knowledge.
4. It is my professional opinion that the prepared testimony is valid and accurate with respect to the issue addressed therein.
5. I am personally familiar with the facts and conclusions related in the testimony and if called as a witness could testify competently thereto.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge and belief.

Dated: _____

Signed: _____

At: Sacramento, California

MARY DYAS
CALIFORNIA ENERGY COMMISSION – COMPLIANCE PROJECT MANAGER

PROFESSIONAL EXPERIENCE

Planner II/III – Energy Facilities Compliance Project Manager ***05/01/2008 to Present***
Siting Unit / Siting and Compliance Office, California Energy Commission, Sacramento, California

Compliance Project Manager—Provide oversight of energy facility construction and operation activities to ensure compliance with conditions of certification. Function as team leader for all compliance monitoring activities, processing of post-certification amendments, complaints, and facility closures.

Currently acting as working team leader on projects filed with the Energy Commission including renewable energy projects (SES Solar One and Solar Two), transmission line projects (Blythe Transmission Line), and natural gas-fired energy projects (Russell City Energy Center) in the licensing, construction and operational phases of each project.

Planner I/II – Energy Facilities Siting Project Manager ***01/18/2006 to 04/30/2008***
Siting Unit / Siting and Compliance Office, California Energy Commission, Sacramento, California

Siting Project Manager – Provide day-to-day management of complex and controversial energy facility siting projects and renewable solar projects, including the Carrizo Energy Solar Farm Project, Bullard Energy Center, El Centro Unit 3 Repower Project and Chevron Replacement Project. Planning, organizing and directing the work of an interdisciplinary environmental and engineering staff team engaged in the review of complex or controversial energy facility siting Applications for Certification.

Energy Analyst / Associate Energy Specialist – LNG Research ***09/27/2002 to 01/17/2006***
Natural Gas Office / Transportation Division, California Energy Commission, Sacramento, California

Coordinating and assisting with the facilitation of monthly Interagency LNG Working Group meetings involving cooperative federal, state, and local agencies; assisting with report writing conducting LNG facility assessments; Organizing/facilitating public workshops and preparing status reports on LNG facility development for use by Commissioners and Governor's Office, as well as reviewing and analyzing LNG-related legislative bills in California; Creating and maintaining the Commission LNG webpage, researching and preparing numerous LNG fact sheets for public education, and gathering information on new technology, tracking new LNG projects, and LNG market information.

Office Technician / Energy Analyst - Assistant Siting Project Manager ***06/27/2000 to 09/27/2002***
Siting Unit / Siting and Compliance Office, California Energy Commission, Sacramento, CA

Assisting energy facility project managers with organization of and conducting workshops and public meetings between staff and power plant developers, other governmental agencies, private organizations, and the public. Also assisting with the reviewing, evaluating and editing of project correspondence, reports, and testimony as well as assisting project secretaries, and Office Managers as needed. Also performed all the same duties in relation to the Emergency Power Plant Permitting 21-day, 4-month, 6-month and 12-month projects.

Office Technician / Energy Analyst - Assistant Siting Project Manager ***06/27/2000 to 09/27/2002***
Siting Unit / Siting and Compliance Office, California Energy Commission, Sacramento, CA

Managing the Siting Peak Workload Contract, including the preparation of hundreds of work authorizations, invoices, and general coordination of work between technical staff and contractor and preparing associated budget information for office managers and executive office.

EDUCATION

Bachelor of Science degree in Biological Sciences ***California State University, Sacramento ~ 1995***



BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

**APPLICATION FOR CERTIFICATION FOR THE
GENESIS SOLAR ENERGY PROJECT**

Docket No. 09-AFC-8

PROOF OF SERVICE
(Revised 3/10/10)

APPLICANT

Ryan O'Keefe, Vice President
Genesis Solar LLC
700 Universe Boulevard
Juno Beach, Florida 33408
E-mail service preferred
Ryan.okeefe@nexteraenergy.com

Scott Busa/Project Director
Meg Russel/Project Manager
Duane McCloud/Lead Engineer
NextEra Energy
700 Universe Boulevard
Juno Beach, FL 33408
Scott.Busa@nexteraenergy.com
Meg.Russell@nexteraenergy.com
Duane.mccloud@nexteraenergy.com
E-mail service preferred
Matt Handel/Vice President
Matt.Handel@nexteraenergy.com
Email service preferred
Kenny Stein,
Environmental Services Manager
Kenneth.Stein@nexteraenergy.com

Mike Pappalardo
Permitting Manager
3368 Videra Drive
Eugene, OR 97405
mike.pappalardo@nexteraenergy.com

Kerry Hattevik/Director
West Region Regulatory Affairs
829 Arlington Boulevard
El Cerrito, CA 94530
Kerry.Hattevik@nexteraenergy.com

APPLICANT'S CONSULTANTS

Tricia Bernhardt/Project Manager
Tetra Tech, EC
143 Union Boulevard, Ste 1010
Lakewood, CO 80228

Tricia.bernhardt@tteci.com

James Kimura, Project Engineer
Worley Parsons
2330 East Bidwell Street, Ste.150
Folsom, CA 95630
James.Kimura@WorleyParsons.com

COUNSEL FOR APPLICANT

Scott Galati
Galati & Blek, LLP
455 Capitol Mall, Ste. 350
Sacramento, CA 95814
sgalati@gb-llp.com

INTERESTED AGENCIES

California-ISO
e-recipient@caiso.com
Allison Shaffer, Project Manager
Bureau of Land Management
Palm Springs South Coast
Field Office
1201 Bird Center Drive
Palm Springs, CA 92262
Allison_Shaffer@blm.gov

INTERVENORS

California Unions for Reliable
Energy (CURE)
c/o: Tanya A. Gulesserian,
*Rachael E. Koss,
Marc D. Joseph
Adams Broadwell Joesph
& Cardoza
601 Gateway Boulevard,
Ste 1000
South San Francisco, CA 94080
tgulesserian@adamsbroadwell.com
rkoss@adamsbroadwell.com

Californians for Renewable
Energy, Inc. (CARE)
Michael E. Boyd, President
5439 Soquel Drive
Soquel, CA 95073-2659
michaelboyd@sbcglobal.net

OTHER

Alfredo Figueroa
424 North Carlton
Blythe, CA 92225
lacunadeaztlan@aol.com

ENERGY COMMISSION

JAMES D. BOYD
Commissioner and Presiding
Member
jboyd@energy.state.ca.us
ROBERT WEISENMILLER
Commissioner and Associate
Member
rweisenm@energy.state.ca.us

Kenneth Celli
Hearing Officer
kcelli@energy.state.ca.us

Mike Monasmi
Siting Project Manager
mmonasmi@energy.state.ca.us

Caryn Holmes
Staff Counsel
cholmes@energy.state.ca.us

Robin Mayer
Staff Counsel
rmayer@energy.state.ca.us

Jennifer Jennings
Public Adviser's Office

DECLARATION OF SERVICE

I, Maria Santourdjian, declare that on March 26, 2010, I served and filed copies of the attached Staff Assessment/Draft Environmental Impact Statement for Genesis Solar Energy Project (09-AFC-8), dated March 26, 2010. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [http://www.energy.ca.gov/sitingcases/genesis_solar].

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(Check all that Apply)

FOR SERVICE TO ALL OTHER PARTIES:

- ☒ sent electronically to all email addresses on the Proof of Service list;
☐ by personal delivery;
☒ by delivering on this date, for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses **NOT** marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

- ☒ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (*preferred method*);

OR

- ☐ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION

Attn: Docket No. 09-AFC-8
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Originally Signed by _____
Maria Santourdjian